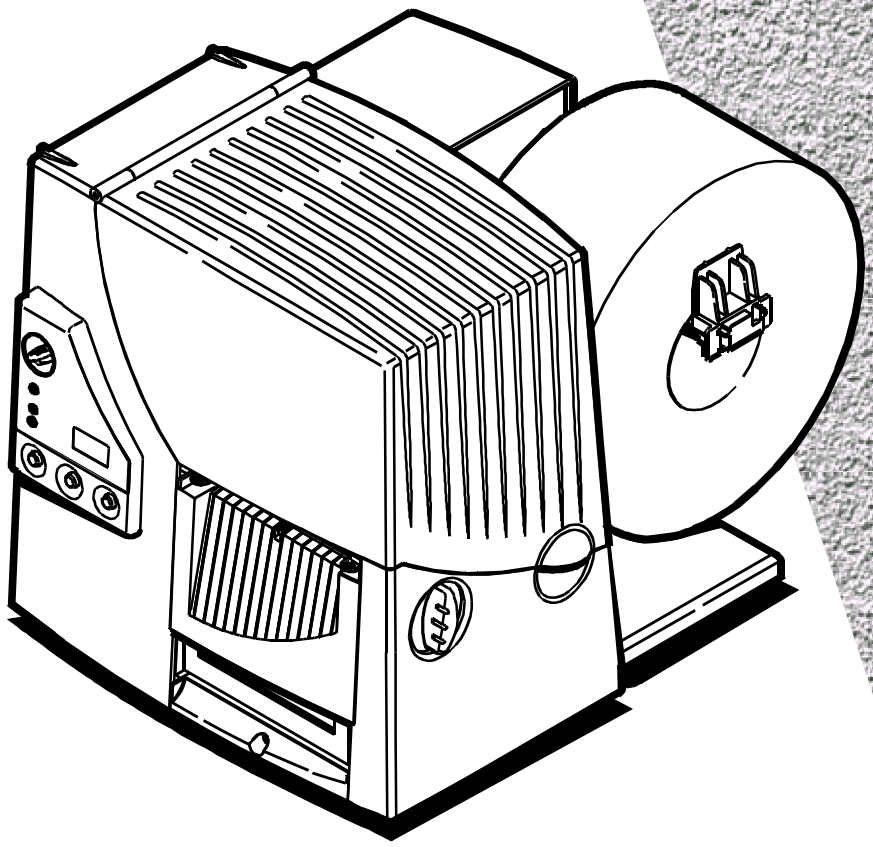
# Service Manual

**Monarch®**
**9820™/ 9830™/ 9835™**
**Printers**



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Monarch®

PAXAR

TC9830SM Rev. B 7/98

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# *Safety Summary*

Warning and caution messages appear throughout this manual. They alert you to potentially safety hazards or potential damage to equipment. The messages and there meaning are shown below.

| WARNING | CAUTION |
|---|---|
| Calls attention to improper practices that could result in a potentially serious, even lethal injury. | Calls attention to practices that could cause minor injury or that could cause damage to equipment. |

Familiarize yourself with proper procedures before operating or repairing the equipment. Follow these precautions for your own safety.

## Personal Safety

- Treat every circuit as if it is "Live". If in doubt, check with a neon tester or voltmeter.
- Know how to turn off power in the work area and how to obtain help in an emergency.
- Don't work on equipment under power unless it's absolutely necessary. If you must, use extreme caution.
- **Shock.** Don't under estimate the danger of shock. 12 mA causes hand muscles to contract, so you cannot free yourself; 24 mA has proven fatal.
- **Tools.** Use the right tools for the job. A tool which slips can cause a short -- or a shock. When working on live circuits, use tools with insulated handles.
- **Safety Devices.** Don't bypass safety devices, particularly fuses. If a hot wire shorts to an ungrounded frame, the frame itself becomes hot and potentially dangerous.
- **Electrical Fires** Use Type C, BC, or ABC extinguishers only.

## Equipment Safety

Your body is a giant capacitor. It can store several thousand volts of electricity. Digital equipment is easily damaged or destroyed by this static electricity. You don't have to see a spark to ruin an IC -- 50 volts is enough. To protect the equipment from static damage, follow these guidelines:

- Ground yourself before reaching into the equipment or touching any circuit board or other electrical component. The Monarch Static Ground Kit contains everything you need.
- Re-ground whenever you have walked away and returned to the equipment. Be especially careful around carpet. Carpet is a major source of static buildup in the body. Even a few steps can recharge you.
- The smaller the object, the greater the precautions must be. A board in the machine is better protected than one which is not plugged in; a chip on a board is better protected than one in your hand.
- Avoid touchings pins coming out of a chip or the connector edge of circuit boards. These metal parts have signal and data lines which are connected directly to fragile circuits.

# CHAPTER 1 PRINTER OVERVIEW & INSTALLATION

## PRINTER FEATURES

The 9820/9830/9835 printers are on-line table-top printers that accepts Monarch Printer Control Language II (MPCLII) data structure.

They use a 203 dpi thermal printhead for printing. The printhead supports both thermal transfer (heat activated ribbon) and thermal direct (heat activated stock) printing.

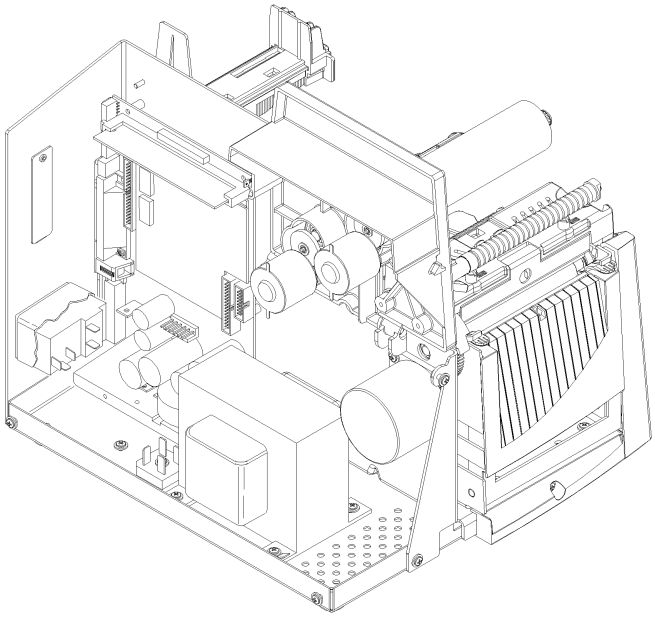


**Figure 1 - 1. 9830 Printer (Housing removed)**

The printers have a hinged print assembly for ease in loading and unloading the supply. The supply spool, lower paper guide, and ribbon spool are center justified and can be adjusted by the user to handle various supply widths.

The printers support fanfold or roll supply. The 9835 supports tag stock to 10 mil thickness. Standard, smudgeless, durable, and steam resistant ribbon types are supported by all printers. Ribbon length is 600 meters and is available in core widths of 1.3", 1.6", 2.16", 3.15", and 4.13". Used ribbon is collected on a take-up spool by taping the ribbon leader to an empty core. One empty core is supplied with the printer.

The 9830/9835 models offer a Service installed tear bar, Flash ROM programming, and an optional Peel Module for separation of supply and backing. The Peel Module is standard on the 9830, optional for the 9835, but not available on the 9820. The 9835 supports either a Peel Module or a knife, but not both.

9820/9830/9835 printer operation is controlled online via an RS-232 port, a Centronics® parallel port, Ethernet adapter, or a CoAx/TwinAx port. Local operation is controlled by the Control Panel and DIP Switch settings and include Printer On/Off, Diagnostics, On-Demand Mode , Error/Fault Condition Indication and Clear.

## PRINTER OPTIONS

These options are available for all printers:

- TwinAx /CoAx Interface
- Memory Expansion Board
- Ethernet Adapter Plug #117531-01 (10BaseT)
- Ethernet Adapter Plug #117532-02 (10Base2)

The following options are available for the 9835 printer:

- 917™ Keypad (for offline batch entry)
- 926™ Knife
- 928™ Stacker (must be used with knife)

The 9835 printer also supports 9445™ emulation, connection for an optional keyboard, and a verifier. Service can install the above options on-site.

**NOTE:** The knife and stacker attachments can be installed by the customer or Field Service technicians. Ethernet Adapter Plugs are not factory installed.

## PRINTER SPECIFICATIONS

| | |
|---|---|
| Height: | 12.5 inches (318 mm) |
| Width: | 12 inches (305 mm) |
| Depth: | 13 inches (330 mm) |
| Weight: | 29 pounds (13 kg) |
| Shipping Wgt: | 33 pounds (15 kg) |
| Power: | 115 VAC, 60 Hz |

| | |
|---|---|
| Fuse, Inlet Module: | 4.0 amp, 250 V Slo-Blow®<br>(1 required) |
| Fuse, Main PCB | 7.0 amp, 125 V Slo-Blow<br>(Soldered radial leads) |
| Tear Bar: | 9830/9835 (Service Installed) |
| Programming: | Flash |
| Communications: | Parallel Port; IEEE 1284 compliant or<br>Centronics Mode |
| Operating Limits: | With Ribbon<br>40 to 95 degrees F<br>(4 to 35 degrees C)<br>Without Ribbon<br>40 to 104 degrees F<br>(4 to 40 degrees C) |
| Storage Limits: | 15 to 120 degrees F<br>(-10 to 49 degrees C) |
| Relative Humidity: | 5 to 90 % Non Condensing |
| Display: | Liquid Crystal Display<br>3 numeric digits<br>Light Emitting Diodes<br>POWER green<br>SUPPLIES amber<br>PAUSED amber |
| Thermal Printhead: | Thin Film<br>4.15 inches (105mm) wide<br>832 dots<br>203 dots/inch (8 dots/mm)<br>0.0049 inch dot width,<br>( 0.1245 mm), center-center |
| Printing Methods: | Thermal Transfer<br>Thermal Direct |
| Supply Types: | 9820 – labels only<br>9830 -- labels only<br>9835 -- labels or tags |
| Ribbon Types: | Roll (Non Cartridge)<br>Standard<br>Smudgeless<br>Durable<br>Steam Resistant<br>High Energy (9830/9835) |
| Ribbon Length | 23,600 inches (600 m) |
| Ribbon Widths: | 1.3 inches (33 mm)<br>1.6 inches (41 mm)<br>2.16 inches (55 mm)<br>3.15 inches (80 mm)<br>4.13 inches (105 mm) |
| Max Ribbon Roll O.D. | 3.6 inches (91 mm) |
| Ribbon Storage: | 41 to 95 degrees F<br>(5 to 35 degrees C) |
| Print Speed: | 2D Bar Code<br>2.5, 4, or 6 inches/sec<br>Serial Bar Code<br>2.5 inches/sec |
| Max Print Image: | 4 inches wide (102 mm)<br>16 inches long (405 mm) |
| Max Print Tolerance: | +/- 0.050 inches (1.3 mm)<br>(side to side) |
| Feed Method: | On-Demand, Continuous, and optional Peel Mode |

# STOCK SPECIFICATIONS

| | |
|---|---|
| Ribbon: Requirements | Thermal Transfer |
| Stock Width: | 1.2 inches (31mm)<br>4.25 inches (108mm) max |
| **Version 5.2** or greater width: | .75 inches (19mm) min |
| Stock Length: | 1 inch (25mm) min<br>16 inches (405mm) max<br>12 inches (305mm) max 9820 |
| **Version 5.2** or greater length: | .75 inches (19mm) min |
| Cut Length: | 1.2 inches (31mm) min with optional knife installed |
| Stock Thickness: | 0.007 inches min<br>(0.18mm)<br>0.010 inches max<br>(0.25mm) |
| Stock Roll: | Outside Diameter<br>9.375 inches ( 229 mm)<br>Inside/Core Diameter<br>3-4 inches (102 mm)<br>8100 inches (200 m) long |
| Stock Output: | Roll or Fanfold |
| Stock Type: | Die cut without Black Mark<br>Black Mark<br>Continuous<br>Coated Supplies |
| **Version 5.2** or greater stock type: | Die Cut Edge<br>Black Mark<br>Continuous<br>Center or Edge Aperture |

# UNPACKING THE PRINTER

1. Clear a work area approximately four feet wide.
2. Open shipping carton top flaps.
3. Remove the Documentation Package. and top pad 000655-05.

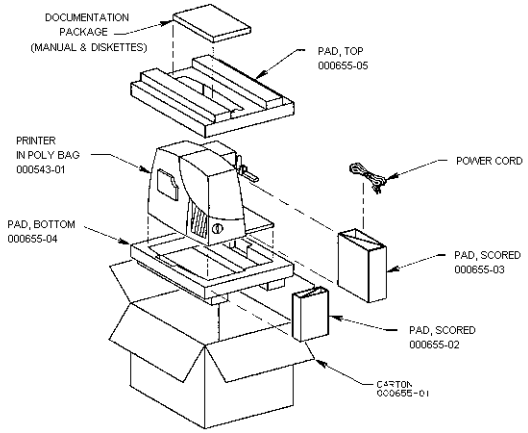



**Figure 1 - 2. Printer Unpacking**

4. Remove scored pad 000655-02 and scored pad 000655-03 (Figure 1-2).
5. Remove power cord from scored pad 000655-03.

**NOTE:** The power cord is not included with some models.

1. Grasp printer at base by inserting hands into cutouts in bottom pad 000655-04. Lift printer out of box and set on solid surface.
2. Remove poly bag 000543-01.
3. Put all packing back in the carton and set carton aside.
4. Inspect printer for damage. Report any damage following established procedures.
5. Open printer door and remove packing tape from the printhead assembly.
6. Remove empty four-inch core from ribbon take-up spool.
7. Install customer's ribbon roll.
8. Install customer's supply stock.

# DOCUMENTATION

The following Documentation Package (TC9830DP or TC9835DP) is provided with each printer:

- quick-set Software Diskettes
- Operator's Handbook

In addition, these documents are available on your Service CD-ROM as Adobe™ Acrobat™ Reader files (.pdf):

- Service Manual TC9830SM
- Programmer's Manual TC9800PM
- TwinAx/CoAx Manual TC9800TXCX

The Operator's Handbook (TC9830OH or TC9835OH) can be ordered separately.

# SETTING DIP SWITCHES

These printers have three sets of DIP switches. Two sets are located on the back of the printer and accessed from outside of the printer. They are designated SW2 (Upper) and SW3 (Lower). The third set is located on the Control Board Assembly daughter board and is designated SW1. The printer is delivered with the SW2 and SW3 DIP Switches set to the defaults shown in Table 1-2. SW1 switch setting are shown in Table 1-1.

**NOTE:** DIP switches are only read at power-up. Turn off the printer immediately after changing DIP switch settings.

To change the DIP switch settings:

**TOOLS REQUIRED:**

Small Flat Blade Screwdriver

**NOTE:** If software control is enabled (by setting rear DIP switches 1 thru 3 to OFF), all rear communications switches are ignored. Downloaded communications settings remain in effect until a new packet is sent or until software control is disabled by setting rear DIP switches 1 thru 3 to a valid baud rate. Downloaded communications settings remain in memory and take effect when software control is again enabled.

DIP Switches for Version 5.2 or greater are shaded.

1. Locate Upper or Lower DIP Switch block as shown in Figure 1-3.
2. Turn printer off and change individual DIP switches as required. Use Table 1-1 as a guide.
3. Daughter board SW1 settings are factory set. However, when replacing the Control Board Assembly, the new board must be set as shown in Table 1-1.

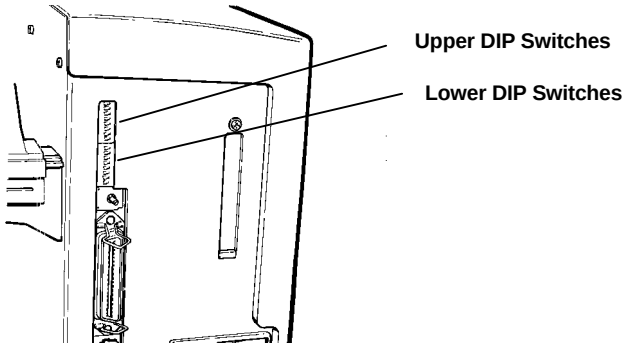



**Figure 1 - 3. SW2/SW3 DIP Switch Location**

**Table 1 - 1. Daughter Board DIP Switches**

| | SW1 Model # | SW2 Peel | SW3 Not used | SW4 Fox IV | SW5 Paxar CL | SW6 Memory |
|---|---|---|---|---|---|---|
| 9820 | OFF | OFF | OFF | OFF | OFF | OFF |
| 9820 with new sensing system | ON | OFF | OFF | OFF | OFF | OFF |
| 9830 No Peel | OFF | OFF | OFF | OFF | OFF | ON |
| 9830 With Peel | OFF | ON | OFF | OFF | OFF | ON |
| Fox IV printer/applicator | OFF | ON | OFF | ON | OFF | ON |
| Paxar CL | OFF | ON | OFF | OFF | ON | ON |
| 9835 With Peel | ON | ON | OFF | OFF | OFF | ON |
| 9835 With Knife | ON | OFF | OFF | OFF | OFF | ON |
| 9835 No Peel/Knife | ON | OFF | OFF | OFF | OFF | ON |

# FUSE REPLACEMENT

Refer to the *Operator's Handbook* for fuse replacement procedures.

# CONNECTING TO A HOST

For instructions on connecting the printer to a host, refer to the *Operator's Handbook.*

**Table 1 - 2. Exterior Rear (SW2 and SW3) DIP Switch Settings**

Upper DIP Switches:

| SELECTION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | DEFAULT |
|---|---|---|---|---|---|---|---|---|---|
| **Baud Rate** | | | | | | | | | |
| 38400 | ON | ON | OFF | | | | | | |
| 19200 | ON | OFF | ON | | | | | | |
| 9600 | ON | OFF | OFF | | | | | | 9600 |
| 4800 | OFF | ON | ON | | | | | | |
| 2400 | OFF | ON | OFF | | | | | | |
| 1200 | OFF | OFF | ON | | | | | | |
| Software Ctrl | OFF | OFF | OFF | | | | | | |
| **Data Bits** | | | | | | | | | |
| 7 Data Bits | | | | ON | | | | | |
| 8 Data Bits | | | | OFF | | | | | 8 Data Bits |
| **Stop Bits** | | | | | | | | | |
| 2 Stop Bits | | | | | ON | | | | |
| ON Stop Bit | | | | | OFF | | | | 1 Stop Bit |
| **Parity** | | | | | | | | | |
| Even | | | | | | ON | OFF | | |
| Odd | | | | | | OFF | ON | | |
| None | | | | | | OFF | OFF | | None |
| **Parallel Port** | | | | | | | | | |
| Centronics Mode | | | | | | | | OFF | Centronics |
| IEEE-1284 | | | | | | | | ON | |

Lower DIP Switches:

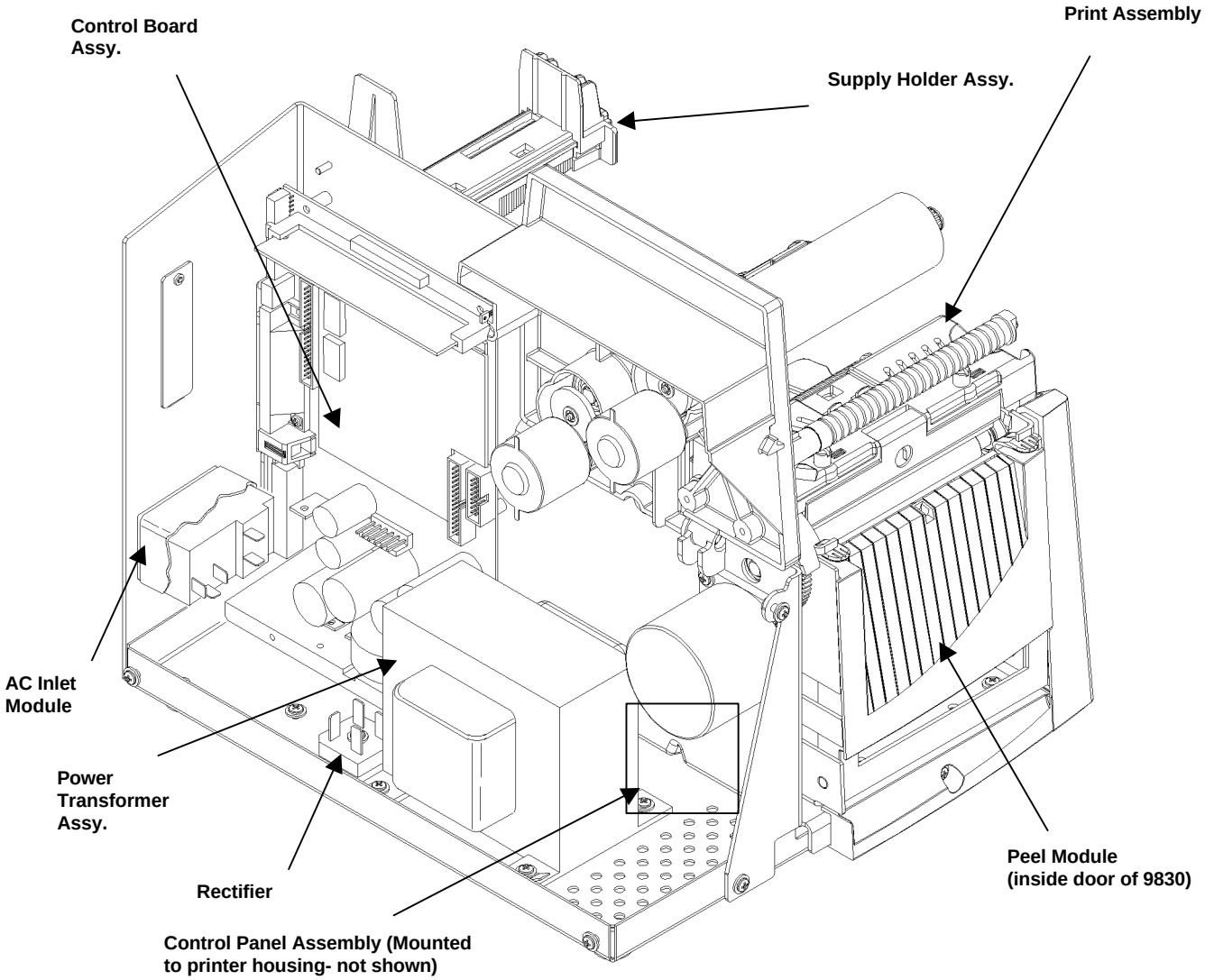
| SELECTION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | DEFAULT |
|---|---|---|---|---|---|---|---|---|---|
| **Flow Control** | | | | | | | | | |
| XON/XOFF | ON | OFF | | | | | | | |
| RTS/CTS | OFF | ON | | | | | | | |
| DTR | OFF | OFF | | | | | | | DTR |
| **Diagnostics** | | | | | | | | | |
| Normal Run Mode | | | OFF | | | | | | Normal |
| Diagnostics Mode | | | ON | | | | | | |
| **Verifier** | | | | | | | | | |
| No Verifier | | | | OFF | | | | | No Verifier |
| Verifier Installed | | | | ON | | | | | |
| **Supply Type/ Sensing** | | | | | | | | | |
| Die Cut or Edge Aperture (edge sensor) | | | | | OFF | OFF | | | |
| Black Mark (center sensor) | | | | | OFF | ON | | | Die Cut |
| Continuous (no sensor) | | | | | ON | OFF | | | |
| Center Aperture (center sensor) | | | | | ON | ON | | | |
| **Ribbon** | | | | | | | | | |
| Transfer | | | | | | | OFF | | Transfer |
| Direct | | | | | | | ON | | |
| **Feed Mode** | | | | | | | | | |
| Continuous | | | | | | | | OFF | Continuous |
| On-Demand | | | | | | | | ON | |

**NOTE:** DIP Switches for Version 5.2 or greater are shaded.

# CHAPTER 2 FUNCTIONAL DESCRIPTION

## OVERVIEW OF MODULES

- Power Transformer Assembly (Power Supply and Distribution)
- Control Board Assy. (Data Handling and Control)
- Peel Module (Supply/Backing Separation)
- Print Assembly (Thermal Control and Motion Synchronization)
- Feed Assembly (Supply Alignment/Tension)
- Supply Holder Assembly (Supply Guide)
- Control Panel Assembly (Operator Interface)



## *Power Transformer Assembly*

The power transformer assembly is located beneath the printer's back cover and includes three components:

### Inlet Power Module

The power module is attached to the printer's rear panel just in front of the Control Board Assy. Its face plate partially extends through the rear panel to allow users access to the power receptacle, fuse box/power selector and the on/off switch. It has wire attachments to ground the Power Transformer.

This module includes the following components:

- International line cord receptacle
- 4.0 Amp, 250VAC Slo-Blow fuse

Line voltage enters at the cord receptacle and passes through a slow-blow fuse. The slow-blow fuse protects the system from damage by power surges. Line ground is provided to the printer via a ground harness connected to the bottom frame.

### Power Transformer

The power transformer is available in three voltages: 110V, 115V, or 220V. It is attached to the frame base just below the print module. The transformer gets AC line voltage from the inlet power module and converts it to two AC output voltages. The first is sent directly to the Control Board Assembly for futher conditioning. The second output is sent to the bridge rectifier for additional conversion.

The power transformer assembly outputs the required AC and DC voltages for operation of the printer and sends both voltages directly to the Control Board Assy. Further conversion and/or distribution is made by the Control Board Assy. Major functions of the power transformer include providing power to the Inlet Power Module, Power Transformer, and to the Bridge Rectifier.

### Bridge Rectifier

The bridge rectifier is a 1" x 1" assembly fastened to the printer frame base left of the power transformer. It has wire attachments to ground, the power transformer, and the Control Board Assy.

The bridge rectifier accepts the AC from the power transformer and converts it to DC. This voltage is then supplied to the Control Board Assembly for further conversion.

# CONTROL BOARD ASSEMBLY

The Control Board Assembly is located on the back side of the printer frame wall beneath the printer's back cover. It consists of a mother board and a daughter board. The two boards are replaced as a single assembly. The board assembly is mounted on six quick-release aluminum standoffs. Three of the standoffs are threaded for retainer screws.

The board has three connectors (serial port, parallel port, and bar code verifier), the print contrast control, and three DIP switch assemblies. Two are mounted on the long vertical side allowing for external access. The third DIP switch is located on the daughter board. There is a connector across the top of the board and a hall effect sensor at the top right corner of the board to sense a "Head Open" condition. Eight additional connectors accept cabling to other printer assemblies.

The daughter board has a connector for cabling to the mother board, and two connectors for functional expansion.

## *Functional Description*

The Control Board Assy. controls all electrical requirements for the printer and contains interfaces for controlling all printer functions, including Ribbon Supply and Take-up motors, Stepper Motor, Peel motor, Knife motor, and the Printhead. A single microcomputing unit consisting of a 32-bit RISC processor, 256K OTPROM (16 bits), and 256K (16 bits) of Dynamic RAM (DRAM) controls the interfaces. Major functions of the Control Board Assy. are:

- Power Conversion
- Memory
- Printer Control
- Operator Panel Control
- Communications
- Contrast Control
- Hardware Power-up Settings (DIP Switches)
- Peel Motor Control
- On-Demand Sensor Interface
- Knife Motor

## Power Conversion

Power conversion interface receives AC and DC voltage from the Power Transformer assembly. 35VAC is converted to +12VDC and -12VDC, while the 40VDC input is converted to +25VDC and +5VDC.

## Memory

Control Board Assebmly contains three types of memory: Flash, DRAM and SRAM.

### Flash Memory

Flash memory contains the necessary BOOT code and Operating System functions for I/O routines used for communications, the application program, fonts, formats, and the Kernel/Library functions.

### DRAM Memory

DRAM is used for variable storage, buffers, and image memory. The base memory configuration for the printer is 256K (16 bits).

### SRAM Memory

SRAM (32K of non-volatile static RAM ) is used to store system parameters and machine totals. All relevant information is automatically stored in the SRAM when the printer is turned off.

## Printer Control

Control Board Assembly controls all printer functions. It use a high performance, 32-bit, RISC based, integrated microcontroller. The microcontroller performs imaging and provides interfaces to printer control operations. Major functions of the board are:

### Data Handling

During operation, communication with both the RS-232 port and the High Speed parallel port is maintained. MPCL data received is transferred to Dynamic RAM (DRAM)

### Printhead Thermal Control

Printhead thermal control operation is a dynamic closed loop servo circuit that adjusts the on/off duty cycle in response to a continuously monitored Printhead operating temperature and resistance.

### Print Imaging

The Thermal Printhead Interface is controlled by the microcontroller. Page image data is transferred from Dynamic RAM to the thermal printhead as a serial data stream.

### Motion Control

Motion control sub-system controls four DC motors. Two DC motors drive the Ribbon control, a stepper motor controls the platen drive, and a fourth motor drives the Peel Module.

### Platen Drive Interface

Control Board Assembly controls the platen drive motor's torque, speed and direction through the use of four phased 25Vdc output signals. Motor torque and direction is controlled by changing the sequence and pattern of the four signals. Motor speed is controlled by increasing or decreasing the speed of the digital pulse that make up the four phased signals.

### Ribbon Drive Interface

Electronically controlled DC motors drive the ribbon over the printhead. The motors, and associated control software, control the tension of the ribbon web as the ribbon spools from the supply side to the take-up side. A speed-detection method using BEMF (Back Electromagnetic Motor Force) provides accurate ribbon tension control.

### Analog to Digital Conversion

An ML2255 A/D converter, in conjunction with the microcontroller, monitors system functions. The A/D converter combines an 8-Bit A/D converter, 8-channel analog multiplexer, and a microcontroller-compatible, 8-bit parallel interface and control logic. The A/D converter monitors various system functions and provides information to the printers firmware to control the supply motion, print quality, etc.

### Supply Detection & Tracking System

See Chapter 8, "Supply Sensing Systems" for more information.

## Operator Control Panel

Printer Control Board uses a Peripheral Interface Unit (PIU) to control the operator control panel interface comprised of a three digit display, three push-button keys and three LEDs.

An optional 917 Keypad is available for the 9835 printer (offline batch entry).

## Communications

RS-232 interface and the Centronics/IEEE 1284 compliant parallel interfaces are mounted on the Control Board Assy. Both are located on the left edge of the board and accessed by the user at the rear of the printer near the supply roll.

#### RS-232 interface

This interface allows connection to devices capable of RS-232 communications. The interface is incorporated in the microcontroller and has DIP switches to set communications parameters. The DIP switches can be set manually by the user or through software control.

#### Centronics IEEE-1284 Parallel Interface

This interface accommodates high data rates, up to 2M Bits/Second.

#### IEEE 1284 Bi-Directional Parallel Interface

An IEEE 1284 High Speed Bi-directional Parallel interface provides parallel communications. The microcontroller directly controls the port. The interface allows compatibility with the Centronics interface as well as allowing for High Speed Bi-directional communications.

**NOTE:** Third party LAN devices are connected through the parallel interface to allow the printer to interface different LAN networks.

### Contrast Control

A manual contrast control, located at the edge of the Control Board Assy., extends out of the rear cover. It is used for fine adjustments to the print contrast values.

### Hardware Power-up Settings (DIPS)

Two 8-switch DIP switches, located on the back panel of the printer above the contrast adjustment, control the default power-up configuration of the printer. Settings include the serial port settings, diagnostics, ribbon setup, printer mode and supply type.

### Peel Module Assembly

The peel module separates the supply from the backing paper. It consists of an on-demand sensor, rollers, and a 12Vdc motor drive. Dip SW1 (switch 2) located on the daughter board enables and disables the peel function.

# PRINT ASSEMBLY

This Print Module is a plastic casting located inside the printer's hood. It is attached to the mid frame by two bearing blocks which capture studs on the module back plate. Components of the Print Module are:

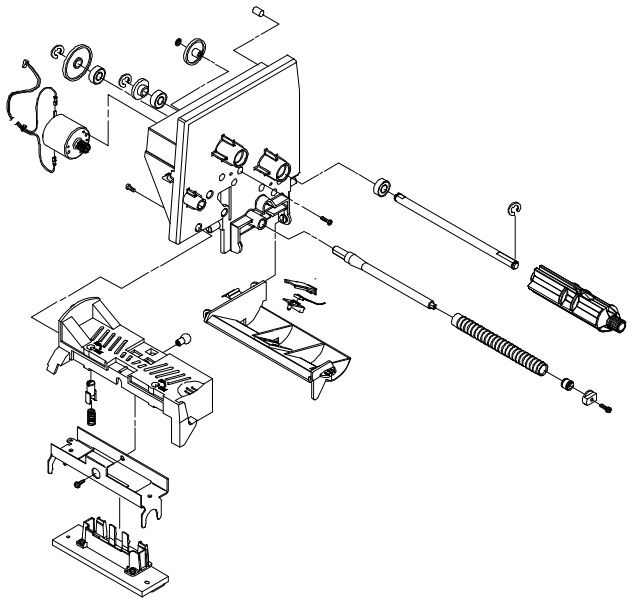


**Figure 2- 1. Print Assembly**

### Thermal Printhead

The printhead is located at the bottom front of the module. It is held in place by a plastic carrier which acts as an interlock to a formed metal bracket. The bracket is center-mounted and pivots to ensure an even pressure on the supply. The printhead bracket has two alignment loops which slip over the platen roller to assure dot row to platen roller alignment. The printhead mount also has two spring loaded adjustment knobs to adjust printhead pressure for wide or narrow supplies. A 30 pin ribbon cable connects the printhead to the Control Board Assy

### Ribbon Supply & Take-up Spools

The ribbon supply and ribbon take-up spools are located on the supply side of the module. Each spool shaft extends through the module wall and connects to its own DC drive motor. The spools are designed to handle a detented ribbon core so when ribbons of various widths are installed they maintain center justification.

### Ribbon Transfer Rollers

Two ribbon transfer rollers are located on the supply side of the module. The rollers are ribbed and attached to metal shafts by retainer screws. One sits at the very front of the module wall above the printhead while the other is positioned just above the supply deflector.

### Ribbon Spool Drive Motors

wo DC ribbon drive motors are mounded to the back of the module wall. Each motor drives a ribbon spool. The motors are connected directly to the Control Board Assembly via separate two-wire harness.

### Supply Deflector and Bi-Cell Emitter (IR LED)

See Chapter 8, “Supply Sensing Systems” for more information.

### Ribbon Transfer Rollers

The two ribbon transfer rollers allow ribbon tension adjustments. Each roller has an eccentric which allows slight skew adjustments to each, which in turn affects the ribbon tension.

## *Functional Description*

The print module, performs ribbon drive operations, provides mechanical ribbon tension adjustments, performs print functions, helps maintain supplies tracking, and houses half of the sensor assembly. It is controlled by the Control Board Assembly.

### Ribbon Drive Operation

The ribbon drive operation is made up of two ribbon spools, two 25Vdc drive motors, and two ribbon transfer rollers. It is controlled by the Control Board Assy. Each drive motor sends continuous information to the Control Board Assy. where it is used to evaluate ribbon conditions, maintain optimum ribbon tension, and sense the end of ribbon condition. This system eliminates the need for ribbon sensors.

### Printing

The printhead has a line array of 832 dot elements sized to produce 203 dots per inch. Printing occurs by sending image data to the printhead one line at a time. Each time a line of data is received, corresponding dots on the printhead are heated to create an image line on the stock. Successive image lines generated across moving stock make up the total image. The Control Board Assy. controls all image data sent to the printhead, and regulates the energy level of the printhead. Energy levels are raised and lowered to create darker or lighter print respectively.

# FEED ASSEMBLY

The feed module components are mounted on a metal frame positioned beneath the Print module and fastened to the printer base. Components of the feed module are:

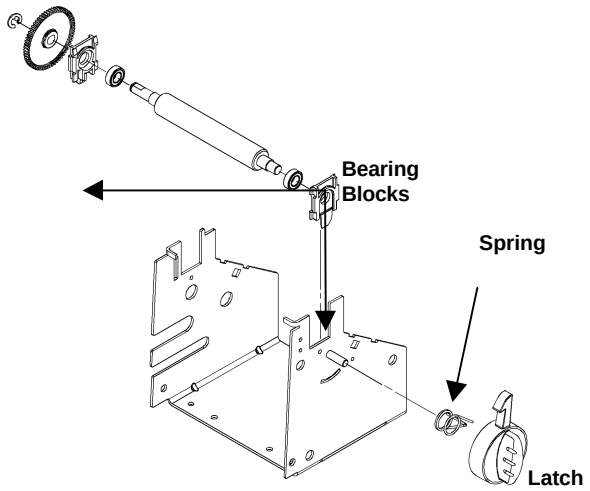



**Figure 2- 2. Feed Assembly**

### Platen Module

The platen rollers are on top of the feed module frame just beneath the printhead. It is held in place by two bearing blocks latched on the frame sides. The inner side of the platen roller shaft extends through the inside wall of the feed module where a drive gear is attached.

### 24VDC Stepper Motor

The stepper motor is located behind the mid-frame of the printer. Its drive shaft and gear extends through to the space between the printer mid-frame and the feed module frame.

### Lower Supply Guide and Bi-Cell Sensor

See Chapter 8, “Supply Sensing Systems” for more information.

### Printhead Latch

The printhead latch is spring loaded and mounted on the outside of the feed module frame; within the latch fascia. It locks the printhead in position.

## *Functional Description*

The feed module transports supply through the printer and across the printhead. It also maintaining proper alignment, tension, and speed. This is accomplished by sensing the stock position while securing the printhead down onto the platen roller. Major functions are supply feeding and supply sensing. See Chapter 8, “Supply Sensing Systems” for more information.

### Printhead Locking

Printhead release knob is used to release the print module from its open position.

# SUPPLY HOLDER ASSEMBLY

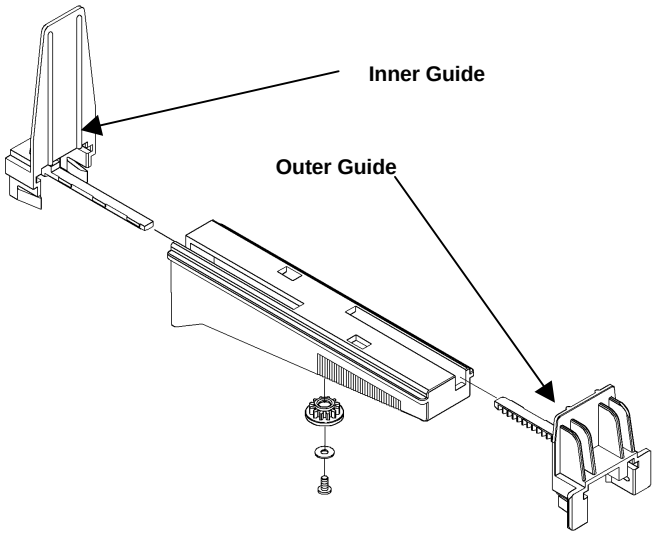



**Figure 2- 3. Supply Holder Assembly**

## *Functional Description*

The supply holder module holds the supply roll in a center-justified position to ensure optimum supply tracking. The guides are gently pushed inward until they center the roll and back off to the next detent position when released.

The front guide pivots down for supply loading/unloading. When loading fanfold supply, the stack is placed behind the printer or under the table and fed through the supply holder guides.

# CONTROL PANEL ASSEMBLY

The Control Panel Assembly is mounted on the front of the printer. The associated electronic components are mounted on a circuit board behind the panel fascia. A ground wire connects the board to the chassis ground and a single wire harness connects it to the Control Board Assy.

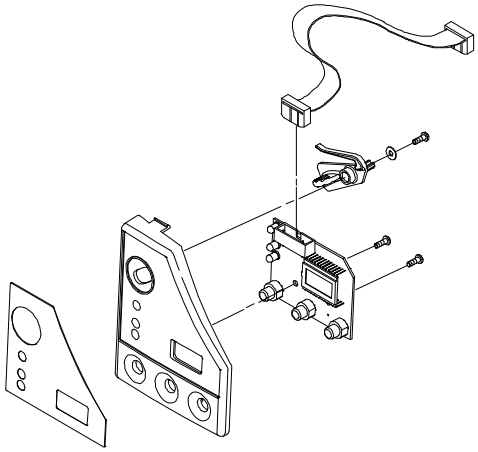


**Figure 2- 4. Control Panel Assembly**

## *Functional Description*

**LEDs** The three LEDs indicate general printer status and activity.

**LCD** The three-character LCD identifies specific printer conditions through the use of numeric codes. These codes are listed and described in Appendix A.

**Feed** In Normal mode, advances a label from the printer. In Offline mode or Online Diagnostic mode, prints a test label.

**Pause** Stops the current batch from printing. Printing resumes when Pause is pressed a second time.

**Clear** Cancels the current batch from being printed if pressed for only a moment. Cancels all batches associated with the current format if pressed and held for two seconds. Cancels some error codes that appear on the LCD.

**Feed + Pause** In Normal mode, prints a test label.

**Feed + Clear** In Diagnostics mode, places the printer in data dump mode. See Chapter 4, “Diagnostics” for more information.

# CHAPTER 3 TROUBLESHOOTING

This chapter contains suggestions for diagnostic and repair actions.

## PRELIMINARY CHECK

The following checks should be made before going further:

1. Are the DIP switches set properly to match communication values and existing supply? See Chapter 1 for DIP Switch settings and procedures.
2. Ensure that the proper fuse has been installed. See the *Operator's Handbook*.
3. Inspect printhead to ensure it is locked in place.
4. Ensure stock and ribbon are properly loaded. Refer to the *Operator's Handbook* for printer loading instructions.

## ANALYZING FAILURE DURING POWER UP

Each time the printer is turned on, it runs Power-up Diagnostics. These Level 0 Diagnostic Tests are described in detail in Chapter 4. If any of the first eight tests result in a fault condition, a three digit status code is indicated on the Control Panel LCD. As shown in Figure 4-2, if any of the following status codes are indicated, the printer will stop operating, and remain in a "hold mode" until CLEAR is pressed:

| | | | |
|---|---|---|---|
| 909 | Memory Failure | 765 | Printhead Test Failure |
| 911 | Virgin Reset | | |

**NOTE:** These error codes only appear during a power-up test sequence. If a "765" status code is indicated during the power on tests, the printer is still operational but may not be able to print all of the commanded label images.

The Control Panel is tested during the power-up tests by blanking the three digit LCD display momentarily. This is the final Level 0 test, and would be noticed only if a "765" status code were previously indicated.

## EVALUATION OF A 616 ERROR (DOT SHIFTING FAILED)

This error occurs if at least one dot element is non-functional. Shifting the image pattern will not work. You must replace the printhead.

## EVALUATION OF A 704 ERROR (OUT OF SUPPLY)

This error occurs when the sensor is not sensing the supply. This can happen if there is a problem with the supply or with the sensor. Perform the following procedure:

1. Verify stock is loaded and properly aligned in the supply guide.
2. Verify that DIP switches and online settings are set for proper supply type.
3. Check Bi-cell alignment using gray scale, and check operation using diagnostic procedures (be sure to check the harness). See **Sensor Tests** and **Bi-Cell Sensor Adjustment**, in Chapter 8, for instructions.
4. Verify Emitter is operational (including the harness) by using an infrared detector probe.

# EVALUATION OF A 754 ERROR (OUT OF RIBBON)

This error occurs whenever the ribbon stops turning. This can happen if the motors are not working, the stock is binding, the platen is sticky, or if any condition is present that prevents ribbon rotation. Perform the following procedure:

1. Verify Ribbon Motors are turning. If they are not, check connectors to the Control Board Assy. and the connections to the motors.
2. Verify Platen Motor is feeding. If is is not, check the connections.

# EVALUATION OF A 755 ERROR (PRINTHEAD OPEN)

This error occurs if the printhead is not functioning properly. Perform the following procedure:

1. Ensure the printhead is properly latched.
2. Verify that the magnet is present and inserted properly.
3. Verify that sensor is functioning properly.

# EVALUATION OF A 765 ERROR (PRINTHEAD FAILURE)

This error occurs if a dot is out of specification. This error can occur even if print quality is not visibly affected. Operation can be continued until the problem is corrected. Perform the following procedure:

1. Check connections to the printhead.
2. Check the printhead harness.
3. Check the printhead itself and replace if necessary.

# EVALUATION OF THE CONTROL BOARD ASSY.

The following status codes indicate the Control Board Assembly has a fault.

| | | | |
|---|---|---|---|
| 900 | RAM Test Failure | 905 | Illegal Interrupt |
| 901 | ROM/EPROM Test Failure | 906 | Power Failure |
| 902 | Timer Failure | 907 | No Application Memory |
| 903 | Interrupt Test Failure | 908 | NVRAM Checksum Failure |
| 904 | No Kernel Memory | 910 | Warm Restart |

1. To determine if this fault is permanent or temporary, turn the printer off, wait 15 seconds then turn the printer on again. If any of these status codes are repeated, turn off the printer and replace the Control Board Assy.
2. Print a test label. See **Test Label (Level 1)**, in Chapter 4, for instructions on printing a test label.
3. Place the printer in Data Dump mode and send data to the printer.

# EVALUATION OF COMMUNICATIONS

If the printer functions properly off-line, examine communications. There are two communication paths for the printer. The RS-232 serial path uses a 25 position connector. The IEEE-1284 parallel path consists of an external 36 position connector, CN1, and an internal 40 position connector, CN5, that is used to support the Coax/TwinAx Interface. CN1 also supports an external Ethernet adapter.

The external Coax/TwinAx Interface is a 15 position connector into which is plugged either a Coax adapter cable or a TwinAx adapter cable. (All electronic activity for the serial port is limited to the Control Board Assembly. All electronic activity through CN1 is limited to the Control Board Assy.) There is a small circuit board mounted on the inside rear printer wall that interconnects the 15 position external connector with the internal CN5. Both CN1 and CN5 share common PCB electronics.

1. Make sure the printer is plugged in and connected to a host with the proper cables. See **Connecting to a Host**, in Chapter 1.
2. Compare host communication values to values reported on the test label. See **Test Label (Level 1)**, in Chapter 4, for instructions on printing a test label.
3. Check printer ports using SENDFILE to send an ENQ.

# GENERAL TROUBLESHOOTING SUGGESTIONS

There are a number of printer self-reporting fault detection/fault isolation avenues built into the 9820/9830/9835 printers. Three digit status codes, detailed in Appendix A, all help to pinpoint the problem. In addition, the printer provides status information in the two test labels, in the SENDFILE service diagnostics tests, and in information labels printed in response to a FEED command following a status code between 571 through 619.

| PROBLEM | SUGGESTED ACTION |
|---|---|
| Printer does not print test labels | Check for status code on LCD.<br>Verify stock is installed correctly.<br>Verify ribbon is installed correctly.<br>Verify printer voltage measurements.<br>Verify printhead is installed correctly.<br>Verify printhead harness connection is on PCB.<br>Verify DIP switch settings.<br>Confirm supply feed operation.<br>Confirm ribbon feed operation.<br>Perform sensor display service test using SENDFILE.<br>Perform test label immediate command.<br>Replace control panel.<br>Replace printhead.<br>Replace Control Board Assy. |
| Printer only prints test labels | Check for status code on LCD.<br>Verify comm DIP switch settings.<br>Perform serial /parallel comm test.<br>Perform data transfer immediate commands.<br>Transfer format using Windows Terminal. |

| PROBLEM | SUGGESTED ACTION |
|---|---|
| Partially printed data | Check for status code on LCD.<br>Verify wide/narrow printhead adjustment.<br>Perform sensor display service test.<br>Verify ribbon installed correctly.<br>Confirm ribbon feed operation.<br>Clean printhead.<br>Confirm supply sensor operation.<br>Send a packet you know has no syntax errors. |
| Printing shadows or smears | Check status code on LCD.<br>Verify wide/narrow printhead adjustment.<br>Perform contrast sensor display service test using SENDFILE.<br>Verify supply installed correctly.<br>Verify ribbon installed correctly.<br>Confirm stock feed operation.<br>Confirm ribbon feed operation.<br>Clean printhead. |
| Light printing | Check status code on LCD.<br>Verify wide/narrow printhead adjustment.<br>Perform contrast sensor display service test using SENDFILE.<br>Adjust contrast.<br>Verify ribbon installed correctly.<br>Confirm ribbon feed operation.<br>Check platen roller surface.<br>Clean printhead. |
| Heavy printing | Check status code on LCD.<br>Perform contrast sensor display service test using SENDFILE.<br>Adjust contrast.<br>Verify correct stock/ribbon installed correctly.<br>Clean printhead. |
| Voids in printing | Check status code on LCD.<br>Confirm test label printhead operation.<br>Perform printhead sensor display service test using SENDFILE.<br>Replace printhead.<br>Confirm fault via immediate command service test.<br>Confirm test label printer config parameters.<br>Verify communication DIP switch settings.<br>Send a corrected format packet.<br>Perform terminal data transfer tests.<br>Replace Control Board Assy. |

# CHAPTER 4 DIAGNOSTICS

If you have any problems using SENDFILE, refer to the *Sendfile Manual* on your Service CD-ROM.

The following diagnostics are resident in the 9820/9830/9835 printer's firmware ROM:

- Power-Up Self-Test
- Test Label
- Service Diagnostics (Level 1)
  - Data Dump Mode
  - Diagnostics Test Mode
    - Off-line Diagnostics Tests
  - Loopback Test (Level 2)
  - Parallel Port Test (Level 3)

## POWER-UP SELF-TEST

When the printer is turned on, a test sequence is initiated. The diagnostics routine initializes the Control Board Assembly and evaluates the Printhead. The test sequence is:

- Non-Volatile RAM Byte Test
- Version String Mismatch
- Printhead Dot Resistance

A failure in any of the test sequences results in the display of an error code on the 3 digit Control Panel Display.

An error during the printhead dot test indicates that bar code scan quality may be compromised. However, such a failure may not be evident in text printing.

### *NV RAM ByteTest*

The Non-Volatile RAM test checks the first two bytes of NVRAM. If the test passes, the next test begins. If the test fails, error #909 appears on the display.

### *Version String Mismatch*

The version string test compares the software version in ROM to the version in RAM. If the versions match, the current software is in RAM and the software clears storage RAM. Then the software clears the working storage routine. If the versions in ROM and RAM do not match, error #911 appears on the LCD.

#### System Restart Condition

The three conditions that cause a system restart are:

- Different versions of software installed.
- Clearing memory with the "Reset NVRAM" function in service diagnostics.
- Memory corrupt due to a hardware/software error.

If the restart flag was set during these diagnostic tests, the software re-allocates all available memory as blocks of working storage. Then the routine performs an integrity check on the working storage to verify that it is accessible.

When the version string mismatch test passes, the firmware begins the printhead dot resistance test.

### *Printhead Dot Resistance*

The printhead resistance routine is a hardware test of all 832 individual dots for correct resistance value. If the test passes, the printer switches to online ready mode. If the test detects any dots that are open or have high resistance (>852 Ohms), error #765 appears on the LCD. Failure does not halt printer operations.

## TEST LABEL (LEVEL 1)

Test Label can be performed in Normal or Diagnostics Test mode. When the printer finishes printing the two test labels, it returns to the ready state.

**MATERIALS REQUIRED:**

Installed supply stock, at least 1" wide X 2" long.

1. If the printer is in Normal Mode, press **Feed** + **Pause** at the same time. If the printer is in Diagnostics Test mode, press **Feed**.

   Two test labels print (See Figure 4-3). If the test fails, an error appears on the LCD. Press **Clear** to reset the printer.
2. Examine the test labels for smearing, image washout, print uniformity, contrast, missing dots, or out of specification readings.

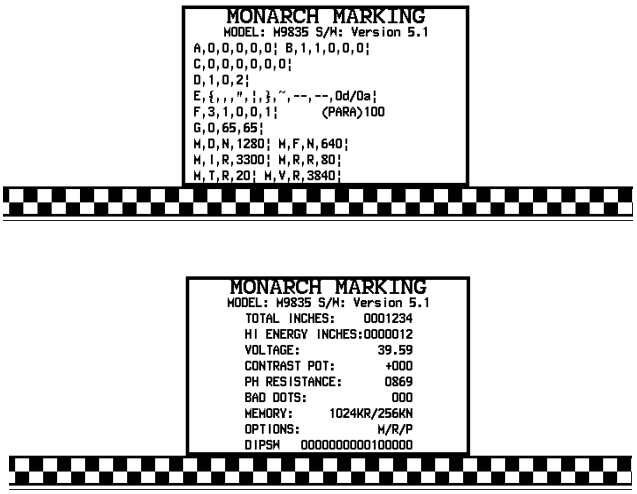



**Figure 4- 1. Test Labels**

The first test label prints firmware version and current printer configuration in `I` packet format (refer to the printer's *Packet Reference Manual* ).

**NOTE:** Some reported settings may not be configurable on a given printer:

| | | | |
|---|---|---|---|
| A | System Setup | E | Control Characters |
| B | Supply Setup | F | Serial Comm Settings |
| C | Print Control | G | Backfeed Control |
| D | Monetary Formatting | M | Memory Allocation |

The second label prints basic diagnostic information:

| | |
|---|---|
| Total Inches Printed | No of Bad Dots (s/b < 3) |
| Current Inches | Total RAM (Max 512K) |
| +40 VDC Value (s/b 30-47) | DIP Settings |
| Dot Resist (s/b 832 Ohms) | Contrast Pot |

Installed Options:

| | |
|---|---|
| M | 256K memory expansion |
| R | RS-232 option (Keypad) |
| V | Verifer |
| P | Peel |
| C | Cutter |
| S | Stacker |
| X | V5.2 sensing system |

# SERVICE DIAGNOSTICS

Service Diagnostics is initiated by setting the Lower DIP switch 3 to the ON position before powering up. At power-up, 000 is displayed on the control panel.

Two Service Diagnostic modes are available:

- Data Dump Mode
- Diagnostics Test Mode
  - Off-line Diagnostics Tests
    - Serial Loop Back Test
    - Parallel Port Timeout Test
    - Test Label
    - Virgin Reset
  - SENDFILE Diagnostic Tests
    - Test Label
    - Sensor Display
    - Service Totals
    - Immediate Commands
    - Job Request
    - Printer Interactive Mode

**Supporting Hardware Accessories Required:**

- SENDFILE and Flashloader requires a laptop or PC connected to the printer via a serial cable. PC should be capable of communicating at 38.4 baud.
- Serial Loop Back Test requires Loop Back Plug #114271.

## *Accessing Diagnostic Modes*

To use the different modes available in Service Diagnostics, you must have lower DIP switch 3 turned on and the display reads 000.

From the 000 display, press **Feed** and **Clear** at the same time until you see 001 (data dump mode), 002 (serial loop back test), or 003 (parallel port test). Each mode is activated by pressing **Pause**.

## *Data Dump Mode*

To use data dump mode:

1. Set lower DIP switch 3 to ON. The display reads 000.
2. Press **Feed** and **Clear** at the same time. The display changes to 001 (Mode 1).
3. Press **Pause** to enter data dump mode. Two blank labels feed and the display reads 111.
4. Download the data stream you want to dump (print on a label).
5. Press **Feed** and **Clear** at the same time to exit data dump mode. The display reads 000.

Data dump mode captures all data being sent to the printer and holds it in a buffer. No data is acted upon (ex: Immediate commands or Job request packets). Once the buffer is full, a label automatically prints with the downloaded data printed on it. You must press **Feed** to print a label if the amount of data sent does not fill the buffer to the required level.

**NOTE:** If you are sending data down through SENDFILE, be sure to disable ENQ. This

applies only when you are in Data Dump mode.

## *Serial Loop Back Test*

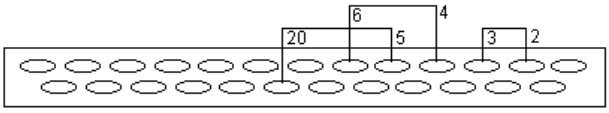
This test evaluates serial port circuits on the Control Board Assembly (nothing external to the Control Board), so communication setting DIPs 1 through 10 do not affect this test.

**TOOLS REQUIRED**:

- Loop Back Plug 114271

1. Turn printer off and disconnect host serial port connector from CN 7.
2. Install Loop Back Plug into RS-232 Serial Port CN 7. See Figure 4-4 for plug wiring.
3. Turn the printer on and go into Diagnostics Test Mode 2 (002). This is accomplished by pressing the **Feed** or **Clear** key from Mode 1 (001).
4. Press PAUSE.

| Jumper Pins | Signal |
|---|---|
| 2-3 | TXD-RXD |




| | |
|---|---|
| 4-6 | RTS/DSR |
| 5-20 | DTR-CTS |

**Figure 4- 2. Loop Back Plug Wiring**

5. The test runs automatically once initiated, and takes approximately two seconds.
6. If the test passes, 222 is displayed. If the test fails (Loopback Plug not installed, installed incorrectly, or bad Control Board Assy. components) error #499 is displayed.
7. Press **Feed** and **Clear** to exit.

## *Parallel Port Test*

The parallel port timeout test can be used with version 3.1 or greater firmware. When the parallel port is in flow control, the printer continues to accept data one character at a time until the entire receive buffer is full. The rate that data is accepted can be set through this diagnostic mode. The default is one character per every 10 seconds. This value prints out on the test label.

To change the parallel port timeout:

1. Set lower DIP switch 3 to ON. The display reads 000.
2. Press **Feed** and **Clear** at the same time until the display reads 003 (Mode 3).
3. Press **Pause** to enter the parallel port timeout mode.
4. Press **Clear** to increase the timeout and press **Feed** to decrease the timeout.
   The display changes to show the amount of the timeout.
5. Press **Feed** and **Clear** at the same time to exit data dump mode. The display reads 000.

The amount of data the application processes from the communication driver is 128 bytes at a time. Flow control is now activated when there is 512 bytes left available in the buffer and flow control is now deactivated when there is 1024 bytes available in the receive queue.

## *Diagnostics Test Mode*

There are two types of Diagnostics Tests; those performed off-line by pressing some keys and those performed using SENDFILE. Table 4-1 lists the tests and procedures that can be performed in Diagnostics Test mode.

**Table 4- 1. Diagnostics Tests**

| DIAGNOSTICS TEST | OFF-LINE ONLINE | KEYS |
|---|---|---|
| Loop Back Test | off-line | Pause |
| Virgin Printer Reset | off-line | Feed+Clear+ Pause |

### Performing a Virgin Printer Reset

A Virgin Printer Reset sets the printer to its original factory settings and erases all data in RAM. To initiate a virgin reset, hold down **Feed** + **Clear** + **Pause** for approximately two seconds, and release.

**NOTE:** Using “Virgin Reset Command“ in SENDFILE requires the Service Password.

### Printing a Test Label

Print a test label by pressing the **Feed** while in Data Dump mode or Diagnostics Test mode. For more information on printing a test label, see “Test Label,” earlier in this chapter.

# CHAPTER 5 TESTS AND ADJUSTMENTS

## SERVICE TESTS

The following tests are described in this section:

- Voltage Tests
- Continuity Tests
- Supply Quality

**NOTE:** Sensor tests are described in Chapter 8, "Supply Sensing Systems."

### CN6 Power Supply

Pin numbers are read from left to right including empty positions.

- Transformer secondary non-rect AC output
  Pin 1 & 3 = 15VAC Pin 3& 4 = 15VAC
- Transformer secondary rect DC output
  Pin 5(+) & Pin 6 (Grnd) = 40VDC

## *Continuity Tests*

### WARNING

Failure to turn off and unplug printer for these test could result in electrical shock.

### Transformer - Primary Side

Should be tested at AC Inlet under the boot.

- Black & Brown = 0-2 ohms
- Black-White & Brown-White = 0-2 ohms
- Orange & Orange-White = 0-2 ohms
- All other combinations must read infinite (open) resistance.

### Transformer - Secondary Side

Ohm reading must be taken with power off.

- At CN6, all combinations of
  Pins 1, 3, & 4 = 0-1 ohms
- At bridge rectifier, reading across both Yellow wires = 0-1 ohms
- All other combinations must read infinite (open) resistance

### Bridge Rectifier

1. Set Ohm meter to 2000K scale.
2. Remove wires from device.
3. Black lead on Red wire terminal (labeled + on device, at the notched corner) and leave attached while moving red lead to other terminals of the device should yield:
   - Red lead on either yellow wire 90° from that corner should read approx. 500 ohms.
   - Red lead on black wire (diagonal from red wire terminal) should read approx. 1000 ohms.

Switch Red lead to red wire terminal and move Black lead to all other positions. The result should be infinite ohms.

### Head Open Sensor

Hall Effect Sensor (HALL1) is located at the top of the board and must be within 6 mm of the magnet.

Top leg of chip (closest to the top edge of the board) changes between +5VDC and ground in response to the magnet in the Print Module. It should be at 0VDC (with respect to frame ground) when head is closed. If magnet is bent, operation may be affected.

### Displaying Machine/Service Totals

This test is performed online using SENDFILE. Only the Service Totals test sequence requires an intermediate step to access. It requires the operator to run Diagnostics (**D**) from the SENDFILE Format Page screen, resulting in the Sensor Display format, and then run Service Totals (**S**) from the Sensor Display screen.

1. Press **M** for Modify Service Totals.
2. The initial Service Totals format has a temporary prompt box in the center of the screen that requests a password.

**NOTE:** If a password is not given, totals are displayed but can not be changed.

3. To modify totals, enter the applicable number (1,2,3,4 ).
4. Before clearing a totals number, the routine prompts another response. Pressing **Y** causes a reset to 0. Any other entry results in an abort.

5. Following a totals number, the routine prompts another response. Any entry other than **Y** results in an abort.
6. Press **D** to return to the Sensor Display screen or press **L** to exit the Sensor Display test sequence.

# *Print Contrast Adjustment*

Adjust print contrast if printing is too light or too dark.

### TOOLS REQUIRED:

- Small Flat-head Screwdriver

Using a small flat-head screwdriver, turn print contrast knob(**clockwise** for **darker** print--**counterclockwise** for **lighter** print).

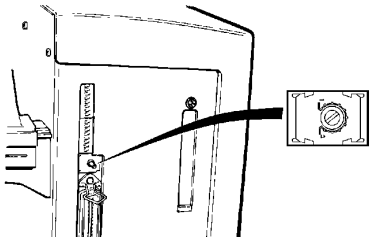


**Figure 5- 1. Print Contrast Adjustment**

**NOTE:** Adjustments may also be made via immediate commands. Refer to the *Packet Reference Manual* for information on proper syntax.

# *Platen Motor Gear Adjustment*

This procedure adjusts the backlash in the platen drive gear train. It should be performed each time a Platen Assembly or a Platen Motor Assembly is replaced.

### TOOLS/MATERIALS REQUIRED:

- 6-inch Phillips Screwdriver
- Paper Shimstock (0.006” to 0.008” thick) or Label Backing Paper Liner (folded 3 layers thick)

1. Turn printer off and unplug power cord.
2. Raise cover and ensure printhead is latched in the down position.
3. Remove printer housing.

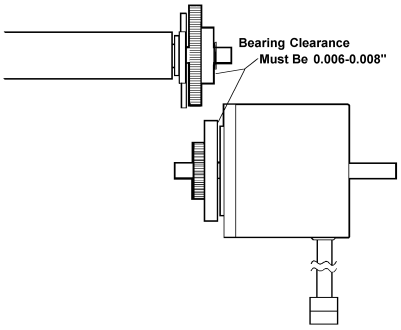



**Figure 5- 2. Platen Motor Gear Adjustment**

4. Using the paper shimstock, check clearance between the bearer on the platen motor gear and the bearer on the platen gear. (See Figure 5-2) Clearance should be between 0.006” and 0.008”.
5. If clearance is less than or greater than the specification, perform steps 7 thru 11.
6. With printhead fully latched, loosen four Phillips head screws holding platen motor.
7. With paper shimstock in place, move platen motor housing to adjust for specification clearance.
8. Tighten all four screws.
9. Rotate platen by hand 360° to check for binding or excessive backlash.
10. Repeat steps 7 thru 10 as necessary.

# *Ribbon Tension Adjustment*

There are two Ribbon Tension Adjustments: The Ribbon Supply Roller Eccentric, and the Ribbon Take-up Roller Eccentric.

Rotation of the supply roller eccentric provides even tension across the width of the ribbon on the supply side of the printhead (Typically, the factory setting for the supply eccentric is primarily horizontal). Rotation of the take-up roller eccentric (adjusted after the supply eccentric) provides even tension across the width of the ribbon on the take-up side of the printhead.

Either adjustment moves the outside end of the ribbon roller to change the pressure on the ribbon. The overall result of properly adjusted eccentrics is consistent ribbon tracking.

### MATERIALS REQUIRED:

- 4” thermal transfer supply (ex: MMTP4055 900091)
- 4” ribbon

1. Ensure printer is in Normal Mode with the printhead Wide/Narrow detents set to Wide.
2. Loosen locking screw and set eccentric at the nominal position (vertical for take-up roller, horizontal for supply roller). See Figure 5-3.
3. Tighten both locking screws.

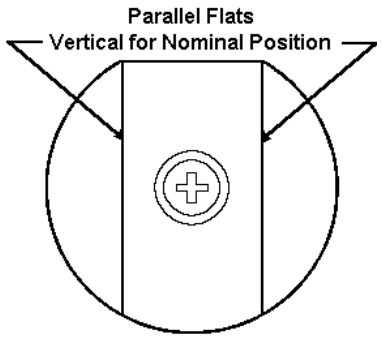



**Figure 5- 3. Eccentric And Locking Screw**

4. Press **Feed** several times until the supply roller serrations are visible across the ribbon width.
5. Turn supply eccentric clockwise until serrations are the same across the ribbon width.
6. Hold eccentric and tighten locking screw to secure the adjustment.
7. Press **Feed** several times until the serrations of the take-up roller are visible across the ribbon width.
8. Turn take-up eccentric clockwise until serrations are the same across ribbon width.
9. Hold eccentric and tighten locking screw.
10. Press **Feed** and **Pause** (to get test labels) several times and watch for ribbon wrinkle.
11. If wrinkles occur, re-check step 8 to ensure take-up roller is properly adjusted. If wrinkles occur, repeat adjustment.
12. Re-check that printhead Wide/Narrow detents are set to Wide (button locked down).
13. Press **Feed** several times and observe the smoothness of the ribbon as it enters the printhead platen roller area. Readjust the supply roller eccentric as required.
14. If wrinkles occur, loosen the take-up eccentric screw with the printer running, and rotate the eccentric to eliminate wrinkle.
15. Hold eccentric and tighten the screw.

# CHECKING SUPPLY QUALITY

The printer continuously stores data from the most recent 16 supplies printed. This checks the reflectivity of the sensor marks on the supply. Before you check your supply quality, print a batch of supplies or test labels. Use Sendfile version 2.19 to check your supply quality. This test can also be performed using the optional 917 Keypad.

To check your supply quality from the optional keypad:

1. From the Diagnostics menu, press < or > until you see

```
  DIAGNOSTICS
← User Diag.      →
```

2. Press Enter. You will be at the User Diagnostics menu. Press < or > until you see

```
  USER DIAG
  Supply Quality  →
```

3. Press Enter. If you have not printed any labels, the message “No data! Press Enter” appears.

If you have printed labels since turning on the printer, you will see

```
   Len   Min   Max   OK
← 1568   034   124    Y  →
```

The Len listing is the length of the loaded supply in dots. The Min listing should be greater than the Max listing when

- white is under the sensor.
- a die cut label gap is under the sensor.

The Max listing should be greater than the Min listing when

- black is under the sensor.
- the solid black area of a die cut label is under the sensor.

The OK listing tells whether the sense mark on the supply passed a detection test. Press > to see the other readings.

If you are not using a Version 5.2 sensing system and you try to check the supply quality, the message “HW not supported” appears.

# CHAPTER 6 SERVICE PROCEDURES

## MAINTENANCE OVERVIEW

This chapter describes removal and replacement procedures for the following assemblies:

Operator Control Panel
Cover Housing
Power Transformer Assembly
    Power Transformer
    Bridge Rectifier
    AC Inlet
Control Board Assembly
Print Assembly
    Bi-Cell Emitter
Upper Supply Guide
    Printhead Module
    Ribbon Spool Assemblies
    Ribbon Roller Assemblies
    DC Ribbon Motors
Feed Assembly
    Platen Module
    Bi-Cell Sensor
    Lower Guide Assembly
Supply Holder Assembly
    Supply Holder
    Supply Holder Guides
Platen Motor
Peel Module

## GENERAL SAFETY TIPS

Note these general safety reminders before servicing the printer. Additional cautions and warnings appear in this document as they apply to specific procedures.

### WARNING

NEVER perform maintenance on the printer with the power cord connected. Doing so exposes points where AC voltages are present. Reattach the power cord only when test procedures indicate that power is required.

### CAUTION

Static electricity can damage printer parts. Use a static ground wrist strap whenever possible. If a wrist strap is not available, ground yourself by touching some metal before touching the printer.

## CONTROL PANEL REMOVAL

**TOOLS REQUIRED**:

- Phillips Screwdriver
- Flat-head Screwdriver

1. Turn the printer off and unplug the power cord.
2. Place printer on a flat, uncluttered surface.
3. Remove Control Panel by applying light downward pressure on the latching tab on the top of panel fascia.
4. Remove ribbon harness assembly by grasping the connector, applying slight force away from the control panel circuit board.
5. Remove single line ground wire.
6. Set Control Panel aside and place the ribbon harness and ground wire back into the printer, to prevent snagging on Cover Housing.
7. Reassemble in reverse order.

## COVER HOUSING REMOVAL

The cover housing is attached to the printer frame by five Phillips head screws. Two screws are located near the printer base, one is behind the Control Panel, and two are on the supply spool frame wall.

**TOOLS REQUIRED:**

- Phillips screwdriver
- Flat-head Screwdriver

1. Remove two screws at printer base.
2. Remove two screws on frame wall.
3. Remove screw from under control panel.
4. Lift cover housing to clear the frame walls.
5. Reassemble in reverse order.

# POWER TRANSFORMER ASSEMBLY

Maintenance of the Power Transformer involves

- removing/reassembling the power transformer.
- removing/reassembling the bridge rectifier.
- removing/reassembling the AC Inlet.

**TOOLS REQUIRED:**

- Longnose Pliers
- Phillips Screwdriver

## *Transformer Removal*

**CAUTION**

You must remove several wires from the Bridge Rectifier, AC Inlet module, and the Control Board Assembly power connector. It is crucial to reconnect the wires properly when replacing the transformer.

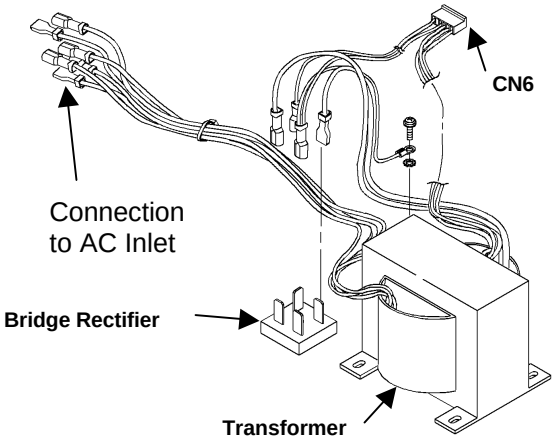



**Figure 6-1. Transformer Wiring Diagram**

1. Remove four bridge rectifier wires as shown in Figure 6-1.
2. Remove power connector CN6 from the Control Board Assembly. (See Appendix C for location of connectors.)
3. Remove six transformer wires from the AC Inlet module.
4. Remove four transformer base screws.
5. Lay the two grounding wires aside so they do not snag when replacing the transformer.
6. Remove the transformer.
7. Reassemble in reverse order.

## *Bridge Rectifier Removal*

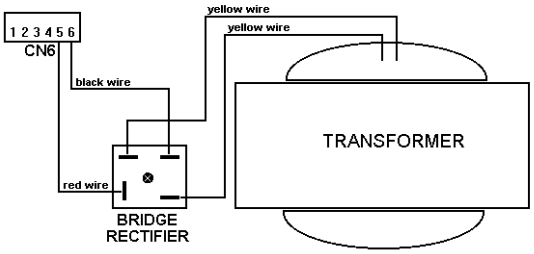


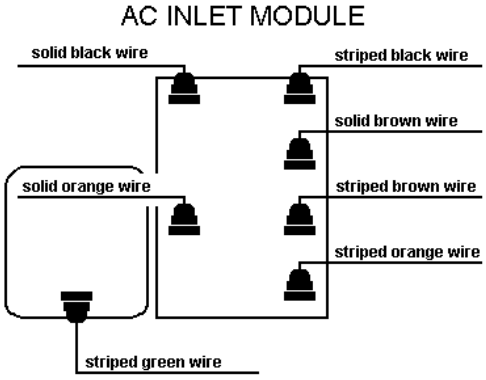

**Figure 6-2 Bridge Rectifier (Four Wires)**

**CAUTION**

The bridge rectifier has four wire connections. See Figure 6-2. Reconnect the black and red wires properly when replacing these wires or the printer could be damaged (voltages vary).

1. Remove the four wires and single retainer screw located in the center of the rectifier.
2. Remove the bridge rectifier.
3. Reassemble in reverse order.

## *AC Inlet Removal*




**6-3 . Bridge Rectifier (Four Wires)**

The AC Inlet has six wires coming from the transformer and one ground wire. Reconnect the wires properly when replacing this part (voltages vary).

1. Release wires from loop holder
2. Remove six wires leading to the transformer.
3. Remove flange screw fastening green wire from the AC Inlet to the Control Board Assembly.
4. Slide AC Inlet boot back and disconnect seven spade connectors wires.
5. Depress top and bottom retaining detents on the AC Inlet and remove it through the back of the printer.
6. Reassemble in reverse order.

## *Control Board Assy. Removal*

The Control Board Assembly has eight connectors to interface with external assemblies. A single connector (CN5) is used with the TwinAx/CoAx interface option as an external interface. The other seven connectors are used with board-mounted option assemblies. The daughter board also has three connectors which must be disconnected for board assembly removal.

**CAUTION**

CN15 and CN16 are identical in appearance, but are oriented differently. Reversing the two connectors could damage the printer.

1. Remove the following connectors from the Control Board:
   - CN2 Printhead
   - CN3 Stepper Motor
   - CN4 Operator Panel
   - CN6 Power
   - CN8 Bi-Cell Sensor (detector)
   - CN11 Bi-Cell Emitter
   - CN15 Ribbon Take-Up Motor
   - CN16 Ribbon Supply Motor

**NOTE:** CN3 is not readily accessible in its installed position. It is removed with the board partially lifted free.

2. Remove wiring at connectors CN3, CN6 and CN10 from the daughter board.
3. Move harness cables aside to allow clearance for board removal.
4. Slide AC inlet module boot back to access connectors.
5. Disconnect seven spade connectors at back of inlet.
6. Release the AC inlet retaining tabs and slide the AC inlet out the back of the printer.
7. Remove the AC inlet's green ground wire from the frame to allow the module to clear the back frame.
8. Before removing the Control Board Assembly:
   - Verify the print assembly is in the closed and latched position.
   - pull the two yellow AC supply wires to the front side of the transformer.
   - reposition the parallel port latch wires inside the frame opening.

**CAUTION**

- Do not bend the hall effect sensor (HALL1), located in the upper right corner of the board. The leaded device is fragile and can be bent or broken easily.
- Use care not to scratch the back side of Control Board with the stand-offs, or the board could be damaged.

9. Remove three stand-off retainer screws located in connectors CN1,CN7, and below CN4.
10. Carefully pull the Control Board off the stand-off detents, while lifting it past the transformer wires to clear the large slot in the rear frame wall.

**CAUTION**

There is a large metal thermal heat sink on the bottom of the board. Snagging it on the AC inlet module boot or transformer wires can damage the equipment.

1. Remove stepper motor connector CN3.
2. Reassemble in reverse order except before seating the Control Board:
   - Reconnect stepper motor connector CN 3.
   - Feed the wire latches through the printer frame opening.
   - Reconnect the ground wire.

# PRINT ASSEMBLY

Maintenance of the Print Assembly involves removing and replacing of the following assemblies:

- bi-cell emitter, upper supply guide, and printhead module.
- ribbon spool and ribbon roller assemblies.

- ribbon motors and print assembly.

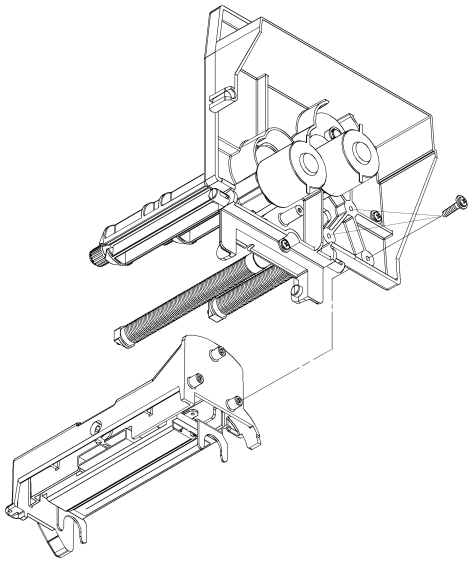


**Figure 6-4. Print Assembly**

**TOOLS/MATERIALS REQUIRED:**

- Phillips Screwdriver
- Flat-head Screwdriver
- Ribbon spool intermediate gear retaining clip.

## Bi-Cell Emitter Removal

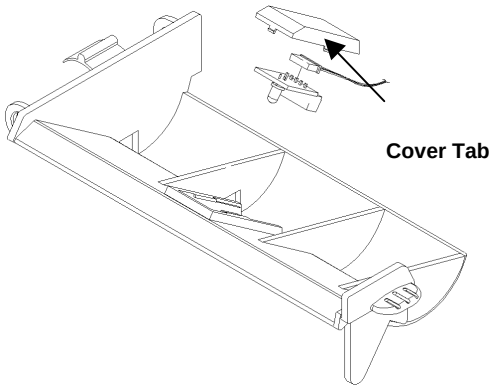



**Figure 6-5. Bi-Cell Emitter Removal**

1. Using fingers, release emitter cover from the emitter housing. Slide the emitter out of the housing. See Figure 6-5.
2. Remove the connector from the sensor circuit board.
3. Carefully work the sensor harness through the upper supply guide openings and through the print assembly opening.
4. Lay the sensor circuit board and harness aside.

## Upper Supply Guide Removal

1. Remove bi-cell emitter from the upper supply guide.
2. Gently pry the supply guide from the pin and remove it.

## Printhead Module Removal

1. Remove the printhead ribbon cable connector at the printhead end.
2. Remove three printhead module screws, as shown in Figure 6-4.
3. Remove the printhead module and lay it aside to prevent it from being damaged.
4. Carefully work the printhead cable back through the exposed cable slot, and lay it aside.

## Ribbon Spool Assembly Removal

1. Remove the C clip at the outer shaft end.
2. Slide spindle off shaft.
3. Reassemble in reverse order.

## Ribbon Roller Assembly Removal

1. Remove the screw at the end of the roller shaft.
2. Slide the serrated roller and eccentric adjuster off the end of the shaft.
3. Reassemble in reverse order.
4. Adjust ribbon tension. See Chapter 5.

## DC Ribbon Motor Removal

1. Locate the two patterns of three recessed screws on the front side of the print module casting.
2. Mark each motor so they aren't interchanged when reassembling.
3. Remove the three screws from each pattern while holding the ribbon motor so it doesn't fall.
4. Unplug the single wire from the Control Board Assy.

## *Print Assembly Removal*

1. Remove two screws holding pivot retainers to the frame.
2. Lift the upper supply guide and remove the retainer pins from the upper supply guide.
3. Remove the magnet from the tunnel housing on the side facing the Control Board Assy. See Figure 6-6. Save the magnet.

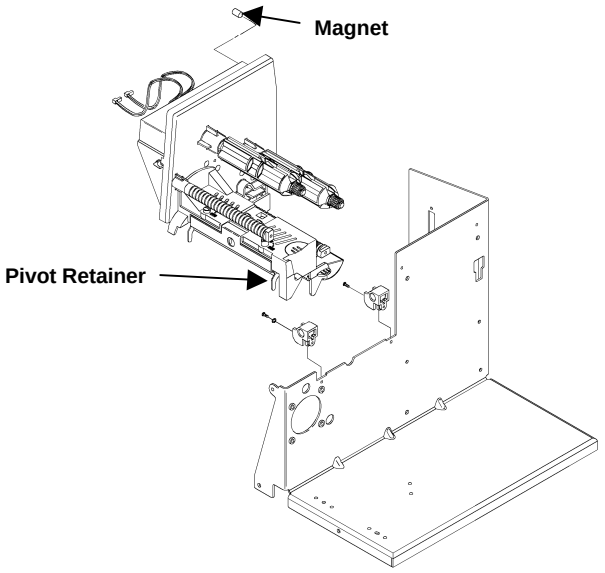



**Figure 6-6. Print Assembly Plate & Printhead Module.**

4. Reassemble in reverse order.
5. Adjust ribbon tension. See Chapter 5.

# FEED ASSEMBLY

Maintenance of the Feed Assembly involves:

- removing the latch fascia and platen module.
- replacing the platen module.
- removing the sensor and lower supply guide.
- replacing the bi-cell sensor and supply guide.

**TOOLS/MATERIALS REQUIRED:**

- Phillips Screwdriver
- Flat-head Screwdriver
- Ribbon spool intermediate gear retaining clip.

## *Latch Fascia Removal*

1. Remove cover housing.
2. Remove snap pin from rear latch fascia by prying gently outward with a screwdriver.

### WARNING

Leave the printhead latched to hold the latch knob in place, or it may fly off and cause harm.

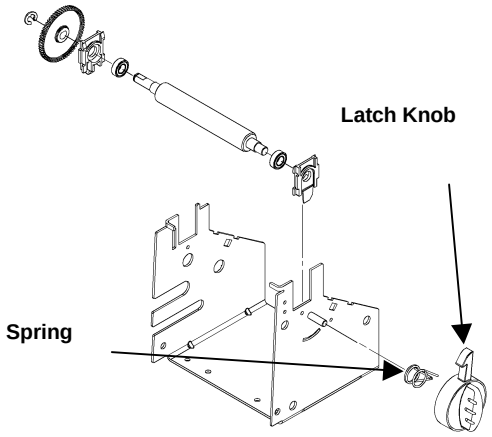



**Figure 6-7. Latch Removal**

3. With the printhead latched, remove the latch fascia. See Figure 6-7.
4. Carefully unlatch and raise printhead.
5. Pull latch knob away from platen frame until the stop tab disengages from the frame.
6. Rotate latch knob counterclockwise until all spring tension is relieved.
7. Remove latch knob and spring.
8. Remove the front exit door by lightly pressing one side, until the hinge pin clears the platen frame.
9. Reassemble in reverse order.

## *Platen Module Removal*

1. Remove the backing paper deflector.
2. Remove the three phillips screws that hold the feed module to the printer base.
3. Lift up on the outboard side of the platen module to allow the platen roller gear to clear the printhead alignment bracket.
4. Rotate the platen module counterclockwise to make room for removal of the platen assembly.

**CAUTION**

The sensor harness limits platen rotation. Be careful not to damage the harness.

5. Unlatch the bearing block latch on each side of the platen roller by inserting a small blade screwdriver between the latch and the platen frame. While holding the latch out with the screwdriver, push the bearing block up so the latch pawl clears the hole in the platen frame.

**NOTE:** Remove the rivot from bearing block on printhead latch side.

6. When both bearing blocks are unlatched, push the platen assembly up and out of the platen frame.

**CAUTION**

Do not run the platen roller into the printhead or the assemblies could be damaged.

## Platen Module Replacement

1. Locate the left side of the platen frame by locating the cable harness exit hole.
2. Turn feed assembly so the drive gear is on the same side of platen frame as cable exit hole.
3. Position bearing blocks in the slot on each side of frame, then push down on roller until bearing block latches snap into place.
4. Rotate platen module clockwise to locate it in its original position. The platen module must be lifted up to allow the platen gear to clear the printhead alignment bracket. Detents in the base plate assure alignment of the platen frame.
5. Reinstall the three phillips screws and tighten.
6. Verify clearance between platen drive gear and the stepper gear bearer, this should not have changed for this procedure. Nominal gap for this adjustment is factory set at .0005".

## Bi-Cell Sensor Removal

1. Grasp the bi-cell sensor holder at its base, squeeze together to release the latch tabs and lift the back of the sensor holder upwards.
2. Release latch tabs by pulling back and up on sensor holder.
3. Rotate sensor holder back to expose sensor circuit board.
4. Insert the blade of a small screwdriver through the sensor holder on the left side (about 3/8" down from the top) and pushs the sensor board away from the sensor housing. (apply thumb pressure to the cover to gain leverage).

**CAUTION**

The recommended pushing location minimizes the possibility for damaging the circuit card.

5. Carefully remove sensor board from sensor holder.

**NOTE:** Use caution not to damage the circuit board.

6. Unplug sensor harness from sensor circuit board by grasping the harness by the connector.

## Lower Supply Guide Removal

1. Turn printer off and unplug AC cord.
2. Remove bi-cell sensor.
3. Remove sensor harness from two retainer loops.
4. Open print module until it latches.
5. Locate locking tabs on either side of the guide frame which lock into the platen frame.
6. With a small straight blade screwdriver, gently pry latches in (towards the feed path) while pushing up on guide frame until latch releases from frame. Repeat for latch on the other side.

## Bi-Cell Sensor Replacement

1. Connect sensor harness to the sensor board.
2. Insert sensor board in holder on an angle to engage board in holder tabs.
3. Apply light pressure on the opposite side of the board to seat board into holder.
4. Ensure sensor window is showing through the hole in sensor holder.
5. Insert top holder tab into guide frame.
6. Pivot sensor holder assembly down and latch the back tabs. Use your thumb to support the under side of the guide frame.

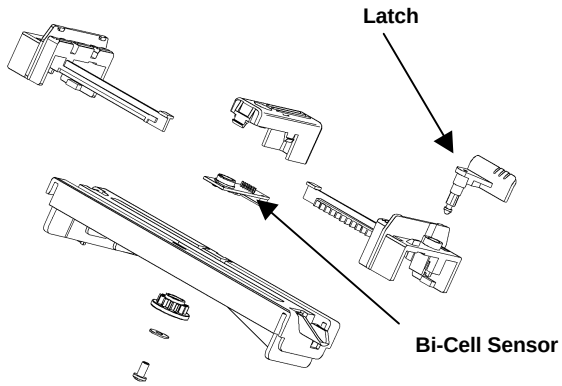



**Figure 6-8. Bi-cell Sensor**

## *Lower Supply Guide Replacement*

1. Reinstall sensor harness through retainer loops.
2. Align guide frame with notches in platen frame.
3. Press down on guide frame until latches engage the platen frame.

# SUPPLY HOLDER

**TOOLS/MATERIALS REQUIRED**:

- Phillips Screwdriver
- Flat-head Screwdriver

## *Supply Holder Removal*

1. Pull upward on supply holder and lift it away from the frame.
2. To replace the supply holder guides:
   - Remove screw from the washer and gear.
   - Pull front guide up and out of frame and replace.
   - Pull back guide up and out of frame and replace.
   - Move front and back guides to the center and install supply gear and washer with the screw.
3. Insert the supply holder into the main frame and push downward.

# PLATEN MOTOR

Disconnect the wires from the AC Inlet to gain access to the stepper motor connector. If you have problems removing the motor (access is difficult), you must remove the Control Board Assy.

**TOOLS REQUIRED**:

- Phillips Screwdriver, Magnetic

## *Platen Motor Removal*

1. Remove Control Board Assy.
2. Remove four screws from platen motor housing.
3. Reassemble in reverse order.
4. Adjust platen motor gear. See Chapter 5.

# PEEL MODULE

Maintenance to the Peel Module includes replacement of the motor and peel roller.

**NOTE:** The peel roller is removed in the same manner as the platen rollers.

**TOOLS REQUIRED**:

- Phillips Screwdriver
- Flat-head Screwdriver

## *Peel Module Removal*

1. Remove printer housing.
2. Unload supply.
3. Raise Printhead and retain it in the up position.
4. Disconnect Peel Motor wiring connector at motor.
5. Remove On-Demand Sensor wiring connector at sensor and release wiring from the door assembly.
6. Remove supply backing exit door assembly.
7. Remove peel module paper exit chute.
8. Remove three screws attaching the peel module to the platen module.
9. Remove Peel Module through the end of the printer.
10. Reassemble in reverse order.

## *Peel Motor Replacement*

1. Remove Peel Module.
2. Carefully pry peel motor gear from shaft.
3. Remove three motor mounting screws and remove motor.
4. Reassemble in reverse order.

# CHAPTER 7 USING FLASH

## FLASH DOWNLOADING PROCEDURES

The following information should be used as a guideline for programming a 9800 series printer using DOS- Flash Download Utility.

**NOTE:** Close all applications to prevent any conflicts with the communications ports on your PC.

**CAUTION**

Follow these steps exactly, failure to do so will result in an unsuccessful attempt that may require board replacement.

1. Open the ZIPPED file (98XXVXX.zip) into a directory called FLASH.

**NOTE:** The PC should be capable of communicating at 38.4 baud.

2. Make sure the printer is powered down.
3. Connect Serial Cable to PC and printer. Cable must support DTR flow control.
4. Note DIP switch settings so printer can be returned to its original configuration.
5. Move ALL DIP switches to the ON position.
6. Turn printer on. The Operator panel will display 001 (ok to download Flash).
7. From FLASH directory type **GO** and press **Enter**.
8. The program will prompt you for COM 1 or COM 2. Select the appropriate port.
   Once you select the COM port, the application begins transfer of data and the green LED will lite. The download takes approximately five minutes at 38.4 baud. The below listed download status codes will be displayed during the download process:
   - 002--Transient Programmer now erasing flash.
   - 003--Transient Programmer now ready to accept download
9. When the application is finished, it will return the PC to the DOS prompt. (C:\Flash) Turn printer off.
10. Return DIP switches to original setting noted in step 4.
11. Turn printer on. Display should read 909.
12. Turn printer off for 10 seconds and then back on. After printer powers up, print a test label to confirm correct operation.
13. Test printer with SENDFILE formats or the customer's data stream.

# CHAPTER 8 SUPPLY SENSING SYSTEMS

Several supply sensing systems have been used for the 9800 series printers. This chapter contains:

- Supply detection and tracking for each printer.
- A description of the supply deflector, Bi-cell emitter, lower supply guide, and Bi-cell sensor.
- Sensor tests and adjustments for each sensing system.
- Information about the version 5.2 sensing system.

## SUPPLY DETECTION/TRACKING SYSTEM

An electro-optical system, consisting of a single infrared emitter and a bi-cell sensor, allows the printer to support die-cut, butt-cut (black mark only), with aperture, and non-indexed supplies. The supply detection and tracking system detects the document edge position and out-of-stock condition. The infrared emitter is located above the web path and is positioned to allow the bi-cell sensor detector to serve as a receiver for recognizing die-cut supplies.

**Version 5.2 or greater:**

The software uses an adaptive threshold algorithm that has successfully been used in the M9446 printer. This method provides the benefit of accurately processing apertures, die cut gaps, and black marks even though the electronic signal response may vary greatly between supply types. It consists of measuring the difference between the minimum and maximum A/D (Analog to Digital converter) values captured from the sensor.

The amplitude of this signal range represents the sensor response to the feature. The minimum value captured plus half the height of the signal range constitutes the threshold level for both the Top of Form (TOF) and Bottom of Form (BOF). This means that on the leading edge of the feature when the threshold value is crossed the BOF is marked. Likewise when the feature is departing the sensor and the trailing edge threshold is crossed the TOF is marked.

TOF/BOF Threshold = Low value + ((High Value - Low Value) / 2)

The paragraph above describes how the algorithm is developed on one feature. For V5.2 the threshold will be an average threshold value calculated from the previous two features.

TOF/BOF Average = (BOF/TOF Threshold1 + BOF/TOF Threshold2) / 2

## SUPPLY DEFLECTOR/BI-CELL EMITTER (IR LED)

The supply deflector is attached to the bottom of the print module and pivots up and down to load labels and ribbon. The IR Emitter is mounted in the center of the deflector, which positions it in the middle of the paper path and above the supply sensor located in the supply guide.

**Version 5.2 or greater:**

The sensing system consists of three sensing systems: an edge justified transmissive sensor, a center justified reflective sensor, and a center justified transmissive sensor which contains an LED positioned directly over the phototransistor of the reflective sensor.

The edge justified transmissive sensor provides an index signal when using die cut labels and edge justified aperture tags. It is mounted on the inside supply guide and moves with the guide depending on the supply width. This sensor is connected with an integral harness to the reflective sensor junction board.

The center justified overhead LED is mounted in the upper supply guide (flapper) and the phototransistor of the reflective sensor (located below the web) and provides an index signal when using center justified aperture tags. The overheard LED is connected with a harness to the reflective sensor junction board. A wire harness connected between the main PCB and the reflective sensor junction board provides the path for the power, ground, LED power, and sensor output signals.

**NOTE:** The new supply guide mechanisms are not backward compatible.

# LOWER SUPPLY GUIDE/BI-CELL SENSOR

The supply guide assembly spans the feed module frame just behind and below the platen roller. It sits within two détentes on each frame edge to maintain proper positioning. It is held in place by individual plastic tabs engaging square holes on both sides of the frame.

Two center-justifying supply guides sit on top of a guide frame and are interlocked. A guide lock arm is positioned on the outside guide. The Bi-Cell supply sensor and housing are attached to the middle of the supply guide frame so that it is lined-up with the IR emitter in the upper supply guide. The sensor wiring harness attaches to the sensor housing and runs along the bottom of the guide frame and through the feed module frame to the Control Board Assembly.

**Version 5.2 or greater:**

The center justified reflective sensor is mounted on the lower supply guide support and provides an index signal when using black mark butt cut labels and black mark tags. The reflective sensor is surface mounted to the reflective sensor junction PCB assembly.

**NOTE:** The new supply guide mechanisms are not backward compatible.

# SUPPLY FEEDING

The main components of supply feeding are the platen roller, 25VDC stepper motor, and supply guide.

Supply guides are used to capture the supply and maintain center-justified tracking. The supply must be positioned between the platen and printhead to feed properly. The printhead applies pressure to the supply to hold it against the platen roller. As the platen roller rotates, the supply is forced to move between it and the printhead. The stepper motor engages the platen drive gear (located behind the inner feed module wall) and drives the platen roller. The function is controlled by the Control Board Assembly.

# SUPPLY SENSING

Supply sensing begins when the IR Emitter in the supply deflector, emits an IR beam through the supply. The Bi-Cell sensor located in the supply guide, receives the beam and changes it into corresponding voltage level. As the beam intensity changes, the associated voltage output of the Bi-Cell also changes. Voltages are reported to the Control Board Assy. where they are compared to a known base-line voltage. When the input characteristics match (relative to predefined times, voltage levels, and expected supply position), a gap or black mark is sensed.

For the 9820/9830 printers, SENDFILE provides volts relating to the sensor's activity as stock moves past the sensor. Two points are of interest: high point (must be approx. 176) and low count (must be approx. 79). Two sensor channels are used. One measures the paper's presence. The other detects the transition from stock to gap and back. These transitions produce an analog waveform which changes from reference (typically -2.5 VDC or approx. 128 A/D counts). These voltages are continually monitored and adjusted by the microprocessor. Because of this microprocessor control, no meaningful static measurements can be made to the sensing circuitry. Paper to Gap is a negative waveform whose active threshold is +1.75VDC or 89 A/D counts. The waveform must drop approx. 10 A/D counts to be acted upon as a valid transition. Gap to Paper is a positive +waveform whose active threshold is +3.25VDC or 166 A/D counts.

The 9835 uses a new sensing system that is optimized for black mark sensing while still having the ability to detect die cut supplies. All 9835 printers contain a set of matched components that are factory adjusted. Our intent is to produce a sensing system that does not require physical alignment in the field. If a sensor fails, order a Sensor Kit (11879801). The kit contains a matched set of components that must be installed and configured using Sendfile Version 2.14 or later.

**Version 5.2 or greater:**

When a label advance command is received the software checks to see if the supply has been calibrated. If not Resync resets the A/D signal measuring parameters. When the supply starts moving forward the A/D signal value is captured. It is matched against the highest value saved and the lowest value saved. If the new value is larger then the current high value or lower than the current low value it replaces that value. In this way the differential between minimum and maximum signal can be determined. Sometimes this differential is referred to as the span. This cycle is repeated for each motor step interval while the motor is running during calibration.

The first transition edge of software significance is the BOF. This is defined as the leading edge of the feature. It is based on an algorithm that on every step checks to see if the AD count is at a value that has passed through a calculated threshold moving from white into the feature. Before the algorithm can be used the signal differential must be larger then a predefined minimum. Once this criteria has been

meet, the threshold count is calculated as the sum of half of the differential between the Low and Hi AD counts captured plus the Low count. When a valid BOF has been found it is saved and used as the threshold for the TOF.

The next transition edge of importance is the TOF. It is defined as the trailing edge of the feature. Once the BOF has been found the software looks for a TOF. In fact it uses the same AD threshold count calculated for the BOF. The difference is that the TOF point is determined as the AD count passes through the threshold from the feature back to white.

The threshold value used for this first feature is not saved in the averaging array because it only represents the minimum span distance as defined by the algorithm criteria. However, by the time the TOF position is reached a full representation of the signal profile has been captured and this actual profile is what is used for BOF/TOF on the second feature.

When the second feature passes by the sensor the valid BOT and TOF are those points that were calculated from the first feature. The threshold points calculated based on the signal profile captured from this feature are saved as the second entry in the array. For the third feature the threshold points become an average of the first two features. Here after the array is continually updated containing the last two threshold values.

The calibration function is complete when the second valid feature is found and measured. The existing software has processed the physical aspects of the label such as print length, feature length and TOF to TOF distance into the tracking system. The software can now track the label just seen by the sensor so that it will be synchronized in correct position under the printhead. Knowing label length provides the ability to predict when the next feature can be expected. Therefore, the only time the sensor will be enabled is after calibration during the window of time when the feature should pass by the sensor. The reason in using a small window is to minimize detection of extraneous pulses that may adversely affect the accuracy of the algorithm.

# MECHANICAL ADJUSTMENTS

This section describes:

- Bi-Cell Sensor Adjustment
- Print Contrast Adjustment
- Platen Motor Gear Adjustment
- Ribbon Tension Adjustment

**NOTE:** Field Service performs no electrical adjustments.

## *Bi-Cell Sensor Adjustment*

1. Turn Printer Off.
2. Load die-cut supply and turn off printer.
3. Connect laptop computer to printer's serial port (laptop must have SENDFILE V2.07 installed).
4. Set DIP switch 3 (bottom set) to ON (Diagnostics Mode)
5. Set DIP switch 6 (bottom set) to OFF (Die Cut).
6. Turn printer on. Printer will feed two labels and display 000.
7. Start SENDFILE (as follows).
8. Press **M** for Model number and press **Enter**.
9. Press **Feed** and **Clear** simultaneously on keypad to access Diagnostics. SENDFILE will display DIAG IDLE.
10. After SENDFILE displays IDLE, press **D** for Diagnostics.
11. Remove Die Cut labels from the printer.
12. Check the emitter for operation, using an Infrared Detector Probe.
13. Cover the Bi-Cell switch with a piece of black electricians tape. Completely block all light. DO NOT TOUCH THE SENSOR LENS WITH YOUR FINGERS.
14. With all light blocked from Bi-Cell, note the reading on SENDFILE. This is the reference value for the sensor. Range is 2.35V to 2.55V. If reading is out of range, replace Bi-Cell Sensor.
15. Remove electrical tape.
16. Place gray scale over sensor, glossy side down. (HANDLE FILTER BY EDGES ONLY. SKIN OILS CAN ALTER THE BI-CELL READING)
17. Close print module and note the Bi-Cell reading in SENDFILE.
18. From back of Bi-Cell housing, turn adjusting screw to obtain the reference value observed in Step 14.
19. Open and close printhead carriage to verify adjustment.

20. Remove gray scale and test printer with customer's supplies.

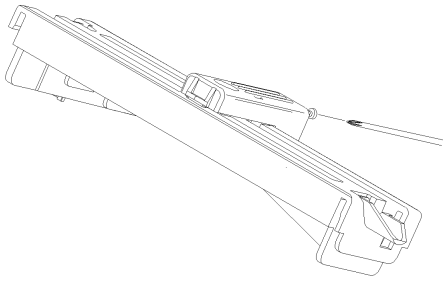


**Figure 8- 1. Bi-Cell Sensor Adjustment**

**NOTE:** A hood covers the adjusting screw on the back of the housing.

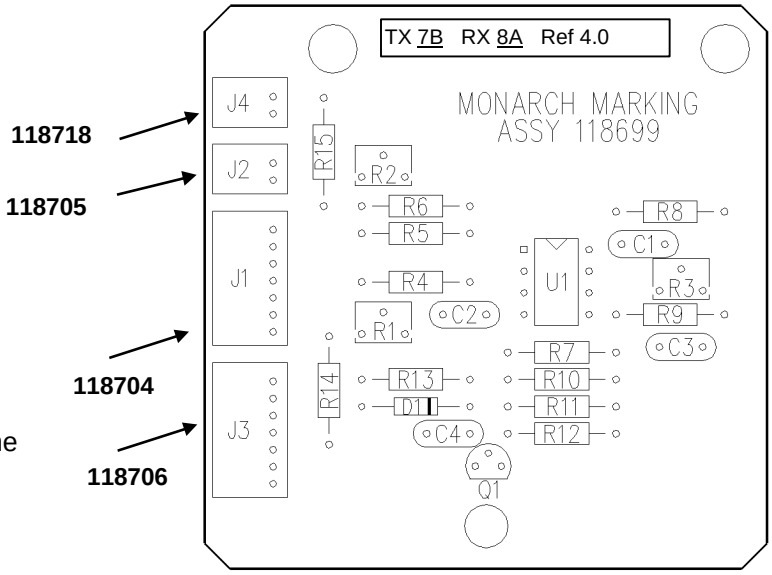



**Figure 8- 2. Sensor Board**

# REPLACING A SENSOR

Use these instructions for 9835 printers version 5.0 or earlier. All of the harnesses are identified with part numbers and must be attached to the sensor board (118699). Follow the same cable routing that was used for the original system.

To replace a sensor:

1. Remove the ferrite noise filter from the old reflective object harness (118704) and install it on the new harness (118704).

**NOTE:** Be sure the Reflective Object Sensor is located in the middle of the sensor housing (117990)

2. Locate the label that is applied to the top of the sensor board (118699) and make note of the Trans and REFL HEX values.
   These values must be entered using Sendfile V 2.15. You must convert the HEX value to decimal using
   Microsoft® Windows® Scientific Calculator.
3. Once the parts have been installed you will need to power up the printer in Diagnostic Mode. Set SW-3 on lower
   bank of switches to the "ON" position and turn on the 9835 printer.
4. Start Sendfile and go to the Diagnostics section. On the left side of the screen you will see a command that says: *Reset 98xx DAC values*.
5. Press "R" to enter this function.
6. A pop up menu appears. This is where the Transmissive (Trans) and Reflective (REFL) values recorded from the board will be entered.
7. Press 2 followed by the 3-digit decimal value converted using the scientific calculator.
8. Press 3 followed by the 3-digit decimal value converted using the scientific calculator. You have now completed the sensor kit installation.
9. Exit Sendfile and take the printer out of Diagnostic mode.
10. Test the 9835 using the customers tags or labels to verify correct operation.

# SENSOR SETUP WITH VERSION 5.2 OR GREATER

Manufacturing sets all three sensors before a printer is shipped. Service needs to adjust the sensor if a sensor component fails in the field or for specific customer supplies. Use Sendfile Version 2.21 (or greater) to set the sensor values. The three sensors are: aperture (center), black mark (center), and die cut (edge).

**WARNING**
**You must follow these steps exactly. Failure to do so may cause the printer to lock up and not be able to recover.**

1. Set switch on bottom row, position #3 (on CPU board) to diagnostic mode.
2. Remove any supply from printer.
3. Close the printhead.
4. Make sure printer is turned OFF.
5. Connect the correct printer voltage (115 or 230).
6. Connect the serial cable to printer and computer.
7. Start Sendfile version 2.21 (or greater).
8. Turn on printer. Press **Clear** if error 792 is displayed.
9. Press **D** to go into diagnostics.
10. For standard 9820/9830/9835 printers, set print contrast to 2.50 (+/- .02). For linerless 9830, set print contrast to 1.25 (+/-.02).
11. Press **X** for sensor adjustments.
12. Press **C** to get to the screen on the right-hand side. It should show version 5.0 at the top right and the center should show aperture die cut black mark. Toggle **C** until you see this screen.
13. Press **S**, this saves the virgin settings.
14. Press **D** to go into diagnostics.
15. Press **X** for sensor adjustments.
16. Press **C** to get to the screen on the right-hand side. It should show version 5.0 at the top right and the center should show aperture die cut black mark. Toggle **C** until you see this screen.

**To set/adjust the aperture (center) sensor:**

17. Remove supplies (if any are loaded) and close printhead.
18. Press **1** to set aperture sensor.
19. Press **A** to automatically set adjustment. The ideal setting is 4.00. The acceptable range is +/- 0.10. The word “Calibrating” appears on the screen. The process is complete when “Calibrating” disappears.

**To set/adjust the die cut (edge) sensor:**

20. Load a minimum of 4-inch long die cut liner stock, with the labels removed. Close printhead.
21. Press **2** to set the die cut sensor.
22. Press **A** to automatically set adjustment. The ideal setting is 4.00. The acceptable range is +/- 0.10. The word “Calibrating” appears on the screen. The process is complete when “Calibrating” disappears.

**To set/adjust the black mark (center) sensor:**

23. Remove the liner stock from the printer.
24. Load a minimum of 4-inch long piece of tag stock into printer. Make sure the black mark is not over the center sensor. Close the printhead.
25. Press **3** to set the black mark sensor.
26. Press **A** to automatically set adjustment. The ideal setting is 4.00. The acceptable range is +/- 0.10. The word “Calibrating” appears on the screen. The process is complete when “Calibrating” disappears.
27. Press **S** to save the adjustments.

The printer displays 909. Turn off the printer. Wait three seconds and turn the printer back on.

# POWER UP SENSOR RECOGNITION

During power up initialization the software checks a reserved area in flash to see if the printer has the V5.2 sensor system hardware installed. If it does then the V5.2 sensing is activated. If not then the daughter board is checked to see if the model switch is set to the 9835 sensing system. If no daughter board is installed, then the 9820/9830 sensor system control software is enabled. For the 9820/30 and for the M9835 the selectable modes are transmissive, reflective, and non-index (continuous) which currently exists in these models.

**Version 5.2 or greater:**

For the new V5.2 system there will be transmissive, reflective, non-index (continuous), and center aperture. The center transmissive sensor is intended only for supplies that have an aperture hole located in the middle of the web. It is referred to as the aperture mode. The transmissive edge sensor is used for both die cut and edge aperture supplies. The reflective sensor is used with center web black marks.

The aperture sensing mode is enabled when the software selects the overhead center of web LED as the emitter and the black mark detector located beneath the web and directly under the LED. If the transmissive mode is selected then the edge sensor assembly will be used. For reflective mode the black mark sensor assembly located under the web will be selected. Lower DIP switches 5 and 6 control the supply type/sensing system.

| Description | 5 | 6 |
|---|---|---|
| Die Cut or Edge Aperture Supplies (edge sensor) | OFF | OFF |
| Black Mark Supplies (center sensor) | OFF | ON |
| Non-indexed/Continuous Supplies (no sensor) | ON | OFF |
| Center Aperture supplies (center sensor) | ON | ON |

The software has the capability of identifying both the Main Processor circuit board level and the sensor system installed in a printer. The V5.2 software is compatible with combinations of previous main processor boards and sensor systems. It also supports the new main processor board with V5.2 and earlier sensor systems installed. Use Sendfile to save (in flash) the code that identifies that the V5.2 sensor hardware is installed.

# *Performing a Sensor Display Test*

This test is performed online using SENDFILE with version 5.0 or earlier printers.

1. To display Analog-to-Digital static values, minimum and maximum A/D dynamic values, or information on options, press **D**.
2. To see the min/max range of each of the A/D channels, highlight each sensor output and press **Enter.** SENDFILE displays the following channels:
   - Uni-cell
   - Head Temp
   - Head Volt:
   - Dot Test
   - Back EMF
   - High Volt:
   - Contrast
   - Bi-cell

**Version 5.2 or greater:**

To perform a sensor test with version 5.2 or greater, see “Sensor Setup With Version 5.2 or Greater” earlier in this chapter.

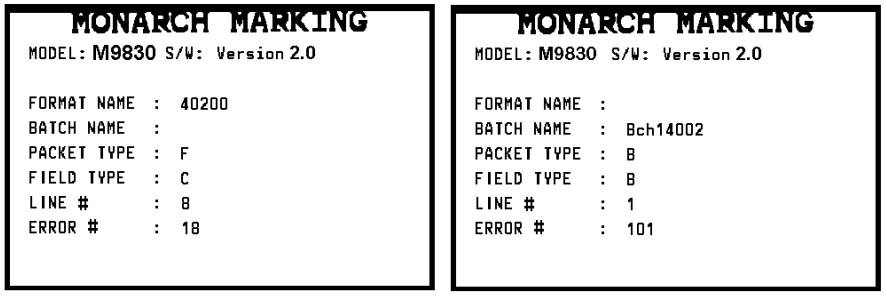
# APPENDIX A PRINTER ERROR/STATUS CODES

This section contains the error/status codes used with the 9800™ series printers. These same codes are called status codes when they are displayed on the Control Panel LCD; and error codes when they are part of Diagnostics "Status Polling" test sequences. These error/status codes are organized into Data Errors, Communications Failures, Data Formatting Failures, Machine Faults, and Hard Printer Faults.

To clear an error/status code, press **Clear**. If a data formatting error (571 through 619) occurs, press **Feed**. The label prints, but data may be missing.

## READING AN ERROR LABEL

An error label queues and prints when you press FEED after a data error occurs. The error label contains the packet type, field type, line number, and error number. The packet and field type return the first letter after the **{** or **¦**. If the letter cannot be determined, **?** is returned. The line number refers to which line in the packet the error occurs. The error number is the three-digit error code. Use this information to correct the format, batch, font, check digit, graphic, or online configuration packet.




The first label shows an error in line 8, which is a constant text field within the format packet. The error number is 18.

The second label shows an error in line 1 of the batch packet. The error number is 101.

## DATA ERRORS (001 - 499)

Error/Status Codes 001 to 499 are data errors. They indicate that incorrect data was received from the external PC, causing the printer to ignore the entire print job. After checking the packet and correcting the problem, transmit the print job again. The following is a list of data errors. These errors occur because data in the format, batch, check digit, font, or graphic packet is invalid.

| Code | Description |
|---|---|
| **001** | Packet ID number must be **1** to **999**. |
| **002** | Name must be **1** to **8** characters inside quotes or a printer-assigned name (""). |
| **003** | Action must be **A** (add) or **C** (clear). |
| **004** | Supply length is invalid. |
| **005** | Supply width is invalid. |
| **006** | Storage device must be **R** (volatile RAM). |
| **007** | Unit of measure must be **E** (English), **M** (Metric), or **G** (Dots). |

**010** Field ID number is outside range **0** to **999**.

**011** Field length exceeds **2710**.

**012** Row field position is greater than maximum stock dimension.

**013** Column field position is greater than maximum stock dimension.

**014** Font style must be **1**, **2**, **3**, **4**, **10**, **11**, **15**, **16**, **17**, **18**, or **50**.

**015** Character rotation must be **0** (0 degree), **1** (90 degree), **2** (180 degree), or **3** (270 degree).

**016** Field rotation must be **0** (0 degree), **1** (90 degree), **2** (180 degree), or **3** (270 degree).

**017** Field restriction must be **V** (variable) or **F** (fixed).

**018** Code page selection defined in field must be **0** (Internal), **1** (ANSI), **2** (DOS 437), or **3** (DOS 850).

**020** Vertical magnification must be **1** to **7** or **4 to 90** points for scalable font.

**021** Horizontal magnification must be **1** to **7** or **4 to 90** points for scalable font.

**022** Color must be **A, B**, **D**, **E, F**, **N, O**, **R**, **S, T,** or **W**.

**023** Intercharacter gap must be **0** to **99** dots.

**024** Field justification must be **B** (balanced), **C** (centered), **E** (end), **L** (left), or **R** (right).

**025** String length is outside range **0** to **2710**.

**030** Bar code height must be at least **20** (English), **51** (Metric), **40** (Dots), and within supply dimensions.

**031** Human readable option must be:

- **0** default
- **1** no CD or NS
- **5** NS at bottom, no CD
- **6** CD at bottom, no NS
- **7** CD and NS at bottom
- **8** no text

**032** Bar code type is invalid.

**033** Bar code density is invalid.

**040** Line thickness must be **0** to **99** dots.

**041** Line direction must be **0**, **90**, **180**, or **270**.

**042** End row is invalid. Line segment or box end row is defined outside of printable area.

**043** End column is invalid. Line segment or box end column is defined outside of printable area.

**044** Dot pattern for line or box must be "".

**045** Line length is defined beyond maximum length.

**046** Line type must be **S** (segment) or **V** (vector).

**051** Imaging mode in graphic header must be **0**.

**101** The format referenced by batch is not in memory.

**102** Print quantity is outside range **0** to **32000**.

**104** Batch mode must be **N** (new) or **U** (update).

**105** Batch separator must be **0** (Off) or **1** (On) in the batch control field.

**106** Print multiple is outside range **1** to **999**.

**107** Cut multiple is outside range **0** to **999**. Only valid for printers with a knife.

**108** Multiple part supply is outside range **1** to **5**.

**109** Reserved for knife usage. Only valid for printers with a knife.

**200** Option number must be **1**, **4**, **30**, **31**, **42**, **50**, **51, 52, 60**, or **61**.

**201** Copy length is outside range **0** to **2710**.

**202** Copy start position must be **1** to **2710**.

**203** Destination start position must be **1** to **2710**.

**204** Source field must be **0** to **999**.

**205** Copy type must be **1** (copy after rules) or **2** (copy before rules).

**206** Increment/Decrement selection must be **I** (increment) or **D** (decrement).

**207** Incrementing start position must be **0** to **2710**.

**208** Incrementing end position must be **0** to **2710**.

**209** The incrementing amount must be **0** to **999**.

**210** Security value for a PDF417 bar code must be **0** to **8**. Correct and resend format to printer.

**211** Narrow element value is less than **1** or greater than **99**. Correct and resend format to printer.

**212** Wide element value is less than **1** or greater than **99**. Correct and resend format to printer.

**213** Dimension must be **1** to **30** for a column or **3** to **90** for a row on a PDF417 bar code.

**214** Truncation code must be **S** (standard) or **T** (truncated bar code).

**215** Aspect code must be **C** (columns) or **R** (rows).

**216** Option definition must be **S** (set) or **T** (template).

**217** Input device must be **D** (Default), **H** (Host), **K** (Keyboard), **N** (None), or **S** (Scanner).

**218** Pad direction must be **L** (from left) or **R** (from right).

**219** Pad character is outside range **0** to **255**.

**220** Check digit selection must be **G** to generate check digit.

**221** Primary or secondary price format is outside range **1** to **15**.

**222** Data type restriction is outside range of **1** to **6**.

**223** Option is not valid for field.

**224** Bar code Interchar gap must be **0** to **99** dots (known as additional character gap with Option 50).

**251** Power up mode must be **0** (online) or **1** (offline).

**252** Language selection must be **0**.

**253** Batch separator code must be **0** (off) or **1** (on) in the system setup packet.

**254** Slash zero selection must be **0** (standard zero) or **1** (slash zero).

**255** Supply type must be **0** (black mark) , **1** (die cut), or **2** (continuous).

**256** Ribbon selection must be **0** (direct) or **1** (transfer).

**257** Feed mode must be **0** (continuous) or **1** (on-demand).

**258** Supply position is outside range.

**259** Contrast adjustment must be **-390** to **156** dots.

**260** Print adjustment must be **-99** to **99** dots.

**261** Margin adjustment must be **-99** to **99** dots.

**262** Speed adjustment must be **25** (2.5 IPS), **40** (4.0 IPS), or **60** (6.0 IPS).

**263** Primary monetary symbol is invalid.

**264** Secondary symbol selection must be **0** (none) or **1** (print secondary sign).

**265** Monetary decimal places must be **0** to **3**.

**266** Character string length in control characters packet must be **5** (MPCL control characters) or **7** (ENQ/IMD command character).

**267** Baud rate selection must be **0** (1200), **1** (2400), **2** (4800), **3** (9600), **4** (19200), or **5** (38400). Resend communication settings packet or check DIP switch settings.

**268** Word length selection must be **0** (7 bits), or **1** (8 bits). Resend communication settings packet or check DIP switch settings.

**269** Stop bits selection must be **0** (1 bit), or **1** (2 bits). Resend communication settings packet or check DIP switch settings.

**270** Parity selection must be **0** (none), **1** (odd), or **2** (even). Resend communication settings packet or check DIP switch settings.

**271** Flow control selection must be **0** (none), **1** (DTR), **2** (CTS/RTS), or **3** (XON/XOFF). Resend communication settings packet or check DIP switch settings.

**272** Internal code page selection must be **0** (Internal), **1** (ANSI), **2** (DOS 437), or **3** (DOS 850).

**273** Cut adjustment must be **-99** to **99** dots.

**282** RS232 Trailer string is too long. Use a maximum of **3** characters.

**283** ENQ Trailer string is too long. Use a maximum of **3** characters.

**284** The storage device type in memory configuration packet must be **N** (non-volatile RAM) or **R** (volatile RAM).

**285** The buffer type must be **T** (Transmit), **R** (Receive), **I** (Image), **F** (Format), or **D** (Downloadable Fonts).

**286** The buffer size is invalid.

**287** The printhead width must be **244** to **812** dots.

**288** The battery voltage must be **0** (15-volt battery) or **1** (12-volt battery).

**289** The printer address specified in communication settings packet must use exactly six characters.

**290** Action must be **0** (disable) or **1** (enable) for backfeed control packet.

**291** Dispense position must be **50** to **200** dots.

**292** Backfeed distance must be **10** to **200** dots.

**310** Check digit scheme number must be **1** to **10**.

**311** Modulus must be **2** to **11**.

**314** Check digit algorithm must be **D** (sum of digits) or **P** (sum of products).

**325** Duplicating direction must be **0** (insert after) or **1** (insert before) in duplicate fields for graphics.

**327** Amount of row adjustment must be **0** to **999** dots in duplicate fields for graphics.

**328** Duplicate count must be **0** to **999**.

**340** Bitmap line encoding must be **H** (hex) or **R** (run length).

**350** Font selector must be **1** to **9999**.

**351** Font data length must be **68** to **16384**.

**352** Insufficient font memory is available for downloaded font.

**380** Job request is outside range **0** to **4**.

**400** The character immediately following **{** is invalid.

**402** Field separator is not in expected location.

**403** Field separator was not found.

**404** The number or string that is currently being processed is too long.

**405** Too many fields exist in format. You cannot have more than 1000 fields in format. Lines, boxes, and constant text fields count as fields.

**409** The printer memory is full. Delete unnecessary formats or graphics from memory. If you are using a graphic file that is very large, consider using another mapping method (such as run length encoding) to reduce required memory.

# COMMUNICATION FAILURES (410 - 499)

Errors 410 to 414 are usually caused by a hardware failure, by an incorrect SETUP option, or by the host PC ignoring flow control (XON/XOFF, CTS/RTS, or DTR). The serial communication settings are:

| | |
|---|---|
| Baud rate | 1200, 2400, 4800, 9600, 19200, 38400 |
| Word length | 7 or 8 |
| Stop bits | 1 or 2 |
| Parity | Odd, Even, None |
| Flow control | None, XON/XOFF, CTS/RTS, DTR |

| Code | Description |
|---|---|
| **410** | Parity on printer doesn't match parity on host. Check parity setting under SETUP options. |
| **411** | Framing error. The printer cannot communicate with host. Make sure host is turned on, communication cables are connected correctly, port settings are correct, and communications are active. Check baud rate, word length, and stop bits to make sure they match those at host. Do not toggle between Microsoft® Windows® and MS-DOS, while using COPY command, or you will receive a framing error. Exit Windows before using COPY command. Re-transmit data. |
| **412** | There is a problem with flow control between printer and host. Make sure printer and host flow control settings match (both are DTR or both are XON/XOFF). |
| **413** | Online receive queue is full. Check your printer's XON/XOFF or DTR SETUP values to be sure there isn't a flow control problem. |
| **414** | The internal keyboard buffer is full or you need a new keypad. |
| **415** | The buffer size you defined exceeds total available in your machine. |

**427** Format name is invalid. Valid name is 1 - 8 characters inside quotes or "" for a printer-assigned name. Press **Clear** and try to continue.

**428** Batch name is invalid or graphic not found. Press **Clear** and try to continue.

**429** A field number appears more than once in a format.

**430** The format uses a graphic file that cannot be found.

**433** The batch references a field number that doesn't exist in format.

**497** An error occurred during loop back test on parallel port.

**499** An error occurred during loop back test on serial port.

# DATA FORMATTING FAILURES (571 - 619)

Formatting errors indicate that a field will print incorrectly. After you have checked the data stream and corrected the data, retransmit the batch. The batch will still print, but the field, font, bar code, or density may be incomplete, missing, or contain incorrect data.

| Code | Description |
|---|---|
| **571** | UPC/EAN data length is invalid. The bar code data length in batch doesn't fit format. |
| **572** | A field (copy, padded, or incrementing) length is invalid. The field length in batch doesn't fit format or field contains blanks. Or, fixed length field doesn't contain specified number of characters. |
| **573** | Price field length is invalid. The price field length in batch doesn't fit format or field contains blanks. |
| **574** | No CD scheme or room for CD. The CD scheme in batch doesn't fit format or field contains blanks. |
| **575** | The graphic included in your format could not be found. |
| **611** | Font, bar code or density is invalid. The font, bar code or density in batch doesn't fit format. |
| **612** | The data in this line of batch is either missing or doesn't match format. |
| **613** | Reference point off tag. |
| **614** | Field is off tag or there is an invalid character in packet. Make sure you did not enter **O** for Ø. |
| **615** | Bar code width is greater than 16 inches or number of keywords for your PDF417 bar code exceeds 928. Decrease density or shorten amount of data to print bar code. |
| **616** | Dot shifting failed. A bad dot falls on a bar code that cannot be shifted. |
| **618** | Magnification must be **1** to **7**, or **4** to **90** for the scalable font. |
| **619** | The JIS (16-bit) code for Kanji is invalid. |

# MACHINE FAULTS (700 - 766)

Errors 700 to 766 occur when there is a problem with the printer.

| Code | Description |
|---|---|
| **703** | The printer sensed a calibration of different-sized black marks. Make sure correct supply is loaded. |
| **704** | Printer has not sensed a supply mark within specified number of inches or out of supplies. |
| **750** | Printhead is overheated. Turn off printer to let printhead cool. |
| **751** | Printer did not sense a mark when expected. |

**752** Printer sensed a mark in wrong place.

**753** Printer sensed a mark that is too long.

**754** The printer is either out of ribbon or ribbon is jammed.

**755** Printhead is open. Close printhead before continuing.

**756** The printer is out of supplies. Load supplies.

**757** Load supplies. The calibrated supply length differs by + or - .25 inches from format. Press **Feed**.

**NOTE:** For errors 751-753, check supply tracking, supply marks, black mark sensor position, supply roll for binding. Then press **Clear**. If error continues to appear, change supply.

| Code | Description |
|---|---|
| **758** | Either on-demand sensor is broken, supply is not seen, or continuous unit set to on-demand mode. Adjust sensor so it is over a white area on supply, or set unit to continuous mode. This error may occur if you remove a label too quickly in on-demand mode. The printer does not recalibrate after this error. |
| **759** | Knife is not moving. |
| **760** | Knife jam. |
| **761** | Stacker is full or jammed. Empty stacker before continuing. The printer does not recalibrate after this error. |
| **762** | Low battery. Recharge battery. |
| **763** | Waiting to dispense label. Press **Feed**. |
| **764** | Verifier failure. Check verifier by referring to your verifier's manual. The printer does not recalibrate after this error. |
| **765** | Printhead failure. You need a new printhead. |
| **768** | Printhead is not present. Make sure the printhead is connected and closed. |
| **770** | Print motor not ready. Call Technical Support |
| **771** | Format specified by application not found. Reload application and format. If problem continues call Technical Support. |
| **790** | Printer busy. Press **Clear**. Resend packets. If problem continues call Technical Support. |
| **791** | Printer has an error pending. Turn printer off. Wait 15 second and turn printer on. Resend packets. If problem continues call Technical Support. |
| **792** | Check daughter board switches or configuration. Reset sensor kit or values. |
| **793** | Printer job queue is full. Turn printer off. Wait 15 seconds and turn printer on. Resend packets. If problem continues call Technical Support. |

# HARD PRINTER FAULTS (900 - 910)

Errors 900 to 910 are hard printer faults. If a 900 series error is displayed, turn the printer off, then cycle on again. If the error occurs again, the Main PCB has probably failed and needs to be replaced.

Errors 905, 906, and 907 can occur at any time the printer is powered. The other 900 series errors are only indicated at Level 0, initial power-up test.

| Code | Description |
|---|---|
| **900** | RAM test failure. |
| **901** | ROM/EPROM checksum failure. |
| **902** | Software timer failure. |
| **903** | Software interrupt failure. |
| **905** | Illegal interrupt. |
| **906** | Non-maskable interrupt. |
| **907** | Low RAM error. |
| **908** | Non Volatile RAM checksum failure. |
| **909** | RAM corrupted. |
| **910** | Warm restart. |
| **911** | Version string mismatch. |

# FLASH FAULTS (930 - 940)

Errors 930 - 940 are errors that may occur during the loading of flash memory.

| Code | Description |
|---|---|
| **930** | Error occurred erasing FLASH. |
| **931** | Error occurred writing FLASH. |
| **932** | Error occurred writing RAM. |
| **933** | Communications parity error. |
| **934** | Communications framing error. |
| **935** | Communications buffer overran. |
| **936** | Invalid record type specified. |
| **937** | Invalid ASCII hex data in record. |
| **938** | Invalid checksum. |
| **938** | Invalid record count recorded. |
| **940** | Illegal FLASH address being programmed. |

# FAULTS (950 - 999)

Errors 950 - 999 indicate circuit board failure. Call Technical Support.

# APPENDIX B CONNECTORS AND CABLES

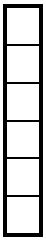
This appendix contains charts of the pinouts for the Control Board Assembly connectors

| | | | | | |
|---|---|---|---|---|---|
| 1 | F PP STROBE bar | 1 | | 2 | LC PD00 |
| 3 | LC PD01 | | | 4 | LC PD02 |
| 5 | LC PD03 | | | 6 | LC PD04 |
| 7 | LC PD05 | | | 8 | LC PD06 |
| 9 | LC PD07 | | | 10 | F MC ACK bar |
| 11 | F MC BUSY | | | 12 | F MC PERROR |
| 13 | F MC SELECT | | | 14 | F MC AUTOFD bar |
| 15 | N/C | | | 16 | CHASSIS GROUND |
| 17 | EMI GROUND | | | 18 | N/C |
| 19 | CHASSIS GROUND | | | 20 | CHASSIS GROUND |
| 21 | CHASSIS GROUND | | | 22 | CHASSIS GROUND |
| 23 | CHASSIS GROUND | | | 24 | CHASSIS GROUND |
| 25 | CHASSIS GROUND | | | 26 | CHASSIS GROUND |
| 27 | CHASSIS GROUND | | | 28 | CHASSIS GROUND |
| 29 | CHASSIS GROUND | | | 30 | CHASSIS GROUND |
| 31 | F MC INIT bar | | | 32 | F MC FAULT bar |
| 33 | N/C | | | 34 | N/C |
| 35 | N/C | 35 | | 36 | F MC SELIN bar |

**Figure B- 1. CN 1 IEEE 1284 Parallel Port**

| | | | | | |
|---|---|---|---|---|---|
| 1 | CHASSIS GROUND | 1 | | 2 | VTPH |
| 3 | CHASSIS GROUND | | | 4 | VTPH |
| 5 | CHASSIS GROUND | | | 6 | VTPH |
| 7 | CHASSIS GROUND | | | 8 | VTPH |
| 9 | CHASSIS GROUND | | | 10 | VTPH |
| 11 | BANK ENABLE OUTPUT | | | 12 | CHASSIS GROUND |
| 13 | VDAT bar | | | 14 | CHASSIS GROUND |
| 15 | LATCH bar | | | 16 | CHASSIS GROUND |
| 17 | TPHCLK | | | 18 | CHASSIS GROUND |
| 19 | TPH STB B bar | | | 20 | TPH STB A bar |
| 21 | TPH STB B bar | | | 22 | TPH STB A bar |
| 23 | TPH STB B bar | | | 24 | TPH STB A bar |
| 25 | TPH STB A bar | | | 26 | N/C |
| 27 | V TM | | | 28 | VREF |
| 29 | + 5 VDC | 29 | | 30 | + 5 VDC |

**Figure B- 2. CN 2 Printhead Assembly**



| | |
|---|---|
| 1 | + 25 VDC |
| 2 | SM PH A |
| 3 | SM PH A bar |
| 4 | + 25 VDC |
| 5 | SM PH B |
| 6 | SM PH B bar |

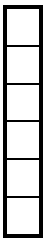
**Figure B- 3. CN 3 Platen Stepper Motor**

| | | | | | |
|---|---|---|---|---|---|
| 1 | LED 1 | 1 | 2 | + 5 VDC |
| 3 | CHASSIS GROUND | | 4 | DISPLAY CLK |
| 5 | CHASSIS GROUND | | 6 | DISPLAY LATCH |
| 7 | CHASSIS GROUND | | 8 | DISPLAY DATA |
| 9 | KEY 1 A | | 10 | CHASSIS GROUND |
| 11 | KEY 2 A | | 12 | CHASSIS GROUND |
| 13 | KEY 3 A | | 14 | CHASSIS GROUND |
| 15 | LED 2 | | 16 | LED 3 |

**Figure B- 4. CN 4 Control Panel**

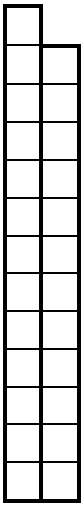
| | | | | | |
|---|---|---|---|---|---|
| 1 | F PP STROBE bar | 1 | 2 | CHASSIS GROUND |
| 3 | LC PD00 | | 4 | CHASSIS GROUND |
| 5 | LC PD01 | | 6 | CHASSIS GROUND |
| 7 | LC PD02 | | 8 | CHASSIS GROUND |
| 9 | LC PD03 | | 10 | CHASSIS GROUND |
| 11 | LC PD04 | | 12 | CHASSIS GROUND |
| 13 | LC PD05 | | 14 | CHASSIS GROUND |
| 15 | LC PD06 | | 16 | CHASSIS GROUND |
| 17 | LC PD07 | | 18 | CHASSIS GROUND |
| 19 | N/C | | 20 | CHASSIS GROUND |
| 21 | F MC BUSY | | 22 | CHASSIS GROUND |
| 23 | F MC PERROR | | 24 | CHASSIS GROUND |
| 25 | F MC SELECT | | 26 | F MC INIT bar |
| 27 | N/C | | 28 | N/C |
| 29 | N/C | | 30 | N/C |
| 31 | N/C | | 32 | N/C |
| 33 | N/C | | 34 | N/C |
| 35 | + 5 VDC | | 36 | CHASSIS GROUND |
| 37 | N/C | | 38 | N/C |
| 39 | N/C | 39 | 40 | N/C |

**Figure B- 5. CN 5 Coax/Twinax Interface**



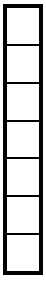
| | |
|---|---|
| 1 | 15 VAC - 1 |
| 2 | N/C |
| 3 | CHASSIS GROUND |
| 4 | 15 VAC - 2 |
| 5 | + 40 VDC |
| 6 | CHASSIS GROUND |

**Figure B- 6. CN 6 Transformer Output Power**



| | | | | | |
|---|---|---|---|---|---|
| 1 | CHASSIS GROUND | 1 | | | |
| 3 | RXD bar | | | 2 | TXD bar |
| 5 | CTS | | | 4 | RTS |
| 7 | CHASSIS GROUND | | | 6 | DSR |
| 9 | N/C | | | 8 | N/C |
| 11 | N/C | | | 10 | N/C |
| 13 | N/C | | | 12 | N/C |
| 15 | N/C | | | 14 | N/C |
| 17 | N/C | | | 16 | N/C |
| 19 | N/C | | | 18 | N/C |
| 21 | N/C | | | 20 | DTR |
| 23 | N/C | | | 22 | N/C |
| 25 | N/C | 25 | | 24 | N/C |

**Figure B- 7. CN 7 RS-232 Serial Port**



| | |
|---|---|
| 1 | BIPOLAR SIGNAL |
| 2 | BP GUARD (GROUND) |
| 3 | UNIPOLAR SIGNAL |
| 4 | UP GUARD (GROUND) |
| 5 | + 12 VDC |
| 6 | 12 V RTN (GROUND) |
| 7 | - 12 VDC |

**Figure B- 8. CN 8 Supply Sensor (Bi-Cell)**

| | | | | | |
|---|---|---|---|---|---|
| 1 | BOARD GROUND | 1 | 2 | VCC | |
| 3 | N/C | | 4 | ROMOE bar | |
| 5 | RSWE bar | | 6 | RSWE bar | |
| 7 | BOARD GROUND | | 8 | MC D16 | |
| 9 | MC D17 | | 10 | MC D18 | |
| 11 | MC D19 | | 12 | MC D20 | |
| 13 | MC D21 | | 14 | MC D22 | |
| 15 | MC D23 | | 16 | MC D24 | |
| 17 | MC D25 | | 18 | MC D26 | |
| 19 | MC D27 | | 20 | MC D28 | |
| 21 | ROMCS1 bar | | 22 | ROMCS1 bar | |
| 23 | ROMCS1 bar | | 24 | ROMCS1 bar | |
| 25 | BOARD GROUND | | 26 | MC D29 | |
| 27 | MC D30 | | 28 | MC D31 | |
| 29 | RSWE bar | | 30 | N/C | |
| 31 | N/C | | 32 | N/C | |
| 33 | MC A21 | | 34 | MC A20 | |
| 35 | MC A19 | | 36 | MC A18 | |
| 37 | MC A17 | | 38 | MC A16 | |
| 39 | MCB A15 | 39 | 40 | MCB A14 | |

| | | | | | |
|---|---|---|---|---|---|
| 41 | MCB A13 | 41 | 42 | MCB A12 | |
| 43 | MCB A11 | | 44 | MCB A10 | |
| 45 | MCB A09 | | 46 | MCB A08 | |
| 47 | MCB A07 | | 48 | MCB A06 | |
| 49 | MCB A05 | | 50 | MCB A04 | |
| 51 | MCB A03 | | 52 | MCB A02 | |
| 53 | RSWE bar | | 54 | BOARD GROUND | |
| 55 | MC D15 | | 56 | MC D14 | |
| 57 | MC D13 | | 58 | MC D12 | |
| 59 | MC D11 | | 60 | MC D10 | |
| 61 | MC D09 | | 62 | MC D08 | |
| 63 | MC D07 | | 64 | MC D06 | |
| 65 | MC D05 | | 66 | MC D04 | |
| 67 | MC D03 | | 68 | MC D02 | |
| 69 | MC D01 | | 70 | MC D00 | |
| 71 | N/C | | 72 | VCC | |
| 73 | N/C | | 74 | N/C | |
| 75 | N/C | | 76 | N/C | |
| 77 | N/C | | 78 | N/C | |
| 79 | N/C | 79 | 80 | BOARD GROUND | |

**Figure.B- 9. CN 10 Board Interface**

| | |
|---|---|
| 1 | TDX ANODE |
| 2 | TDX COMM |

**Figure B- 10. CN 11**

| | |
|---|---|
| | GND |
| | |

Two-wire harness connect red wire to TP5 (+25 volts)

**Figure B- 11. CN 14**

| | |
|---|---|
| 1 | RT_MTR_1 |
| 2 | RT_MTR2 |

**Figure B- 12. CN 15**

| | |
|---|---|
| 1 | RS_MTR_1 |
| 2 | RS_MTR2 |

**Figure B- 13. CN 16**

| | |
|---|---|
| 1 | +12V |
| 2 | GND |
| 3 | -12v |
| 4 | GND |
| 5 | _NO_RAT( +25V) |
| 6 | GND |

**Figure B- 14. CN 19 (to Daughter Board CN3)**

## *Daughter Board Connectors*

| | |
|---|---|
| 1 | +12V |
| 2 | GND |
| 3 | -12v |
| 4 | GND |
| 5 | _NO_RAT( +25V) |
| 6 | GND |

**Figure B- 15. CN 3 To MotherBoard CN 19**

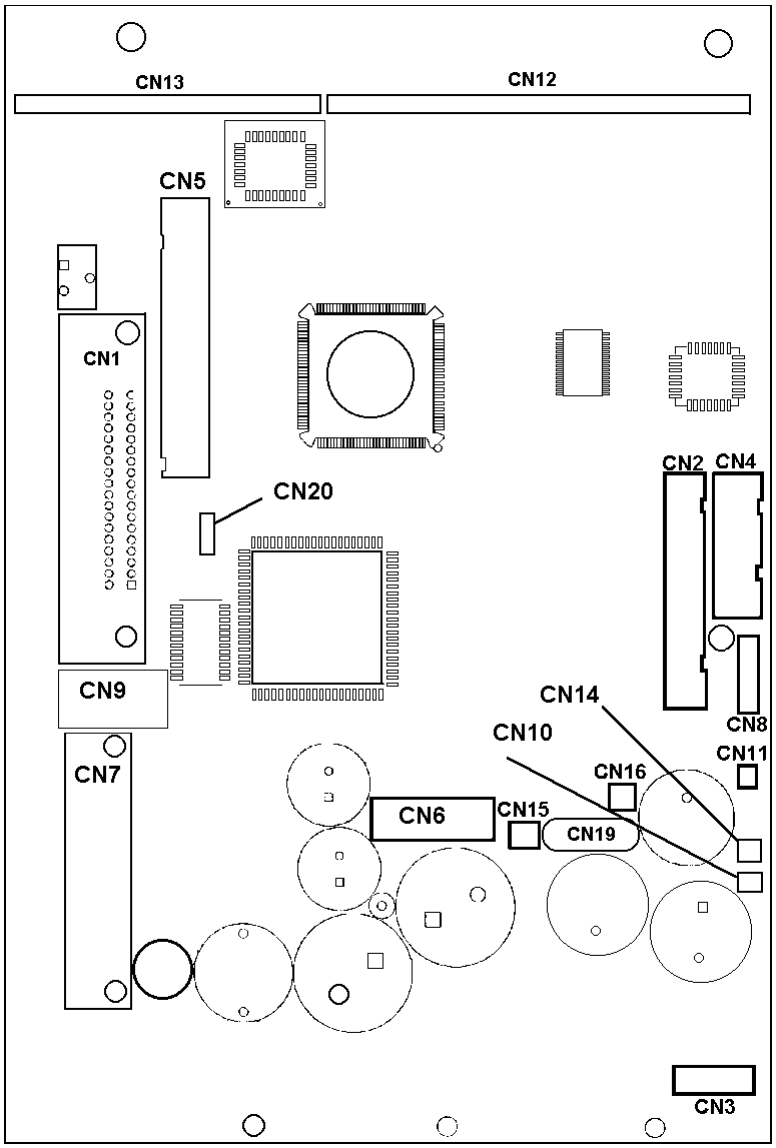
| | |
|---|---|
| 1 | PEEL_MFTR_1 |
| 2 | PEEL_MFTR_2 |

**Figure B- 16. CN 10 Peel Motor**

| | |
|---|---|
| 1 | _OD_A |
| 2 | OD_K |
| 3 | +12V |
| 4 | OD_E |
| 5 | GND |
| 6 | N/C |

**Figure B- 17. CN 6 On-Demand Sensor**

# APPENDIX C CONNECTOR LOCATIONS




**CN14 Top pin for knife motor**

**Figure C- 1. Control Board Assy. (Mother Board)**

**Legend:**

CN1 IEEE 1284 Parallel Port
CN2 Printhead Assy
CN3 Platen Stepper Motor
CN4 Control Panel
CN5 Coax/Twinax
CN6 Transformer Output Power
CN7 RS-232 Serial Port
CN8 Index Sensor Receiver Assy
CN9 Not Used
CN10 Index Sensor Connector Assy (2-wire pigtail) from CN8
CN11 Index Sensor Emitter Assy
CN12 Daughter Board Connector
CN13 Daughter Board Connector
CN14 DRAM Expansion (Not Shown)
CN15 Ribbon Take Up Motor
CN16 Ribbon Supply Motor
CN17-CN18 Engineering Use (Not Shown)
CN19 Daughter Board Connector
CN20 Engineering Use

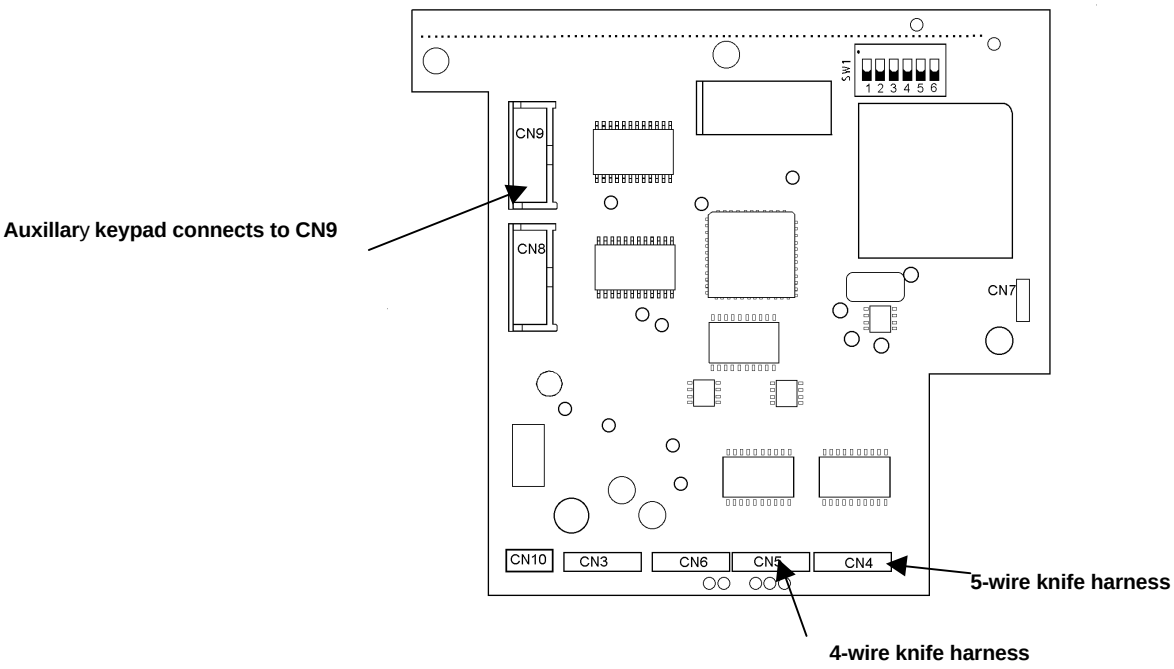



**Figure C-2. Control Board Assy. (Daugher Board)**

**Legend:**

| | |
|---|---|
| CN3 | Mother Board CN19 |
| CN4 | Cutter Option |
| CN5 | Stacker Option |
| CN6 | On-Demand Sensor |
| CN7 | Reserved |
| CN8 | Reserved |
| CN9 | Reserved |
| CN10 | Peel Motor |
| SW1 | See Chapter 1 for settings |

# APPENDIX D MODEL 928 STACKER

The 928 Stacker only works with a 9835 printer with a 926 Knife attached.

## SPECIFICATIONS

| | |
|---|---|
| Height: | 14.4 inches (366 mm) |
| Base Width: | 25.6 inches (650 mm) |
| Tag Bed: | 29.6 inches (752 mm) |
| Depth: | 7.9 inches (201 mm) |
| Weight: | 18 pounds (8.2 kg) |
| Shipping Weight: | 30 pounds (13.6 kg) |
| Power: | 115 VAC, 60 Hz,<br>100 VAC, 50/60 Hz,<br>230 VAC, 50 Hz |
| Capacity: | Up to 1,500 tags with tag thickness of 0.010 inches (.25 mm) thick |
| Operating Limits: | Thermal Transfer:<br>40 to 95 degrees F<br>(4 to 35 degrees C)<br>Direct:<br>40 to 104 degrees F<br>(4 to 40 degrees C) |
| Storage Limits: | 15 to 120 degrees F<br>(-9 to 49 degrees C) |
| Relative Humidity: (Operating and | 5 to 90 percent non Storage): condensing |
| Speed: | Up to 6.0 inches<br>(152 mm) |

Minimum Stackable Tag Sizes:

| | Width | Length |
|---|---|---|
| Printed widthwise: | 1.63 inches<br>(41 mm) | 1.2 inches<br>(30 mm) |
| Printed Lengthwise: | 1.2 inches<br>(30 mm) | 1.57 inches<br>(40 mm) |
| Header Length: | 3.66 inches (93 mm) | |

**NOTE:** Supply roll must be wound printed side in.

## FUNCTIONAL DESCRIPTION

The 928 Stacker consists of the following modules:

- Upper Transport Assembly
- Upper Drive Shaft Assembly
- Lower Transport Assembly
- Stepper Motor
- D C Motor
- Stacker Full/Jam Sensors
- Power Supply
- Control Board

The Model 928 Stacker is attached to a 9835 Printer which has the Model 926 Knife Assembly installed. The printer and knife attaches to tabs on the stacker mounting plate.

A wiring harness carries electronic signals and 12 Vdc from the knife to the stacker. Additional electrical power required by the stacker is provided by an on-board power supply. The power supply converts 115 VAC to 24 Vdc for the DC motor.

The Control Board contains the necessary circurity to provide control of the motors and sensors, and has a daughter board to provide power to the stepper motor.

The DC motor drives the Lower Transport Assembly through a series of pulleys and gears. The Lower Transport Assembly and Upper Transport Assembly move cut tags from the knife to the stacker belt.

A stepper motor drives the stacker belt. As the stacker belt revolves, the accumulating tags move with the belt toward the end of the stacker tray. Belt movement is automatically stopped when the tags reach the end of the stacker tray and the Stacker full sensor sends a stop signal to the printer. Belt movement can also be stopped by turning the printer off.

The purpose of the Stacker Full Sensor is to detect when the stacker tray has been filled with tags and to signal the Stacker Control Board to stop operations.

## INSTALLATION

1. Unpack stacker from shipping carton. Retain carton.

2. Turn printer off.
3. Lift the knife/printer slightly and slide the knife on to the stacker mounting plate tabs.
4. Attach stacker AC power cable to stacker and AC power outlet.
5. Attach knife-to-stacker cable.
6. Adjust cutter as necessary. Refer to *Operating Instructions* TC0928OI.

**CAUTION**

To avoid damage to the motor, the stacker rollers and front of knife must not be in direct contact.

**NOTE:** When installing, make sure the stacker is properly aligned with the knife. The stacker tray should angle down and away from the 926. Align the stacker by lowering the stacker's feet, turn them in to lower and out to raise the stacker. Lock the legs in place by tightening the locking nut provided.

# TROUBLESHOOTING

1. Check AC inlet fuse and power switch.
2. Ensure the stacker-to-knife harness is properly connected.
3. Inspect stacker drive belts for proper adjustment.
4. Check all wiring harness connector for proper connection.

## *Error Messages*

Error Message 761 is shown on the printer display if a stacker fault or jam is detected.

Stacker Full: Empty the tray. Press Clear to clear the error and resume printing.

Stacker Jam: Clear the jam. Press Clear to clear the error and resume printing.

If the jam is not inside the stacker, check inside the knife or printer.

## *Alignment*

The stacker's bed must slant slightly down (away from the knife). Raise or lower the stacker's feet by turning them. Tighten leg nuts to lock into place. For additional alignments, refer to the *Operating Instructions,* TC0928OI.

# CABLES AND CONNECTORS

The following tables provide pinouts for stacker connectors. Connector locations are shown in Figure D-1.

Table D- 1. Stacker Control Harness.

| Knife Connector Pin | Signal | Control Board CN1 Pin |
|---|---|---|
| 1 | STKR_ENABLE | 1 |
| 2 | STKR_PRESENT | 3 |
| 3 | GND | 5 |
| 4 | +12Vdc | 7 |
| 5 | GND | 9 |
| 6 | STKR_ERROR | 10 |
| 7 | N/C | |
| 8 | N/C | |
| 9 | +12Vdc | 2 |
| 10 | GND | 4 |
| 11 | | 6 |
| 12 | | 8 |
| 13 | | 10 |
| 14 | N/C | |
| 15 | N/C | |

Table D- 2 Jam/Full Sensor Harness.

| Control Board CN3 Pin | Full Sensor (S1) Pin | Jam Sensor (S2) Pin |
|---|---|---|
| 1 | 2 | |
| 2 | | 2 |
| 3 N/C | | |
| 4 KEY | | |
| 5 | 1 | |
| 6 | | 3 |
| 7 | 3 | |
| 8 | | 1 |
| 9 | 4 | |
| 10 | | 4 |

Table D- 3. Extended Motor Interface Harness.

**(Soldered to Control Board Connector CN4)**

| Extender Connector Pin | Signal | Stepper Motor Connector Pin |
|---|---|---|
| 1 | | 1 |
| 2 | | 2 |
| 3 | +24 Vdc | 3 |
| 4 | +24 Vdc | 4 |
| 5 | | 5 |
| 6 | | 6 |

Table D- 4. AC Power Harness.

| Power Supply Connector J1 | Signal | Power Switch (SW1) |
|---|---|---|
| Pin | | Terminal |
| 1 | GND | |
| 2 | N/C | |
| 3 | 115 VAC | 1 |
| 4 | N/C | |
| 5 | N/C | |

Table D- 5. Power Supply Connector J2.

| Connector J2 Pin | Signal/Pin | Control Board Connector CN2 Pin |
|---|---|---|
| 1 (Orange) | | 4 |
| 2 | N/C | |
| 3 | N/C | |
| 4 (Brown) | | 5 |
| 5 (Green/Yellow) | GND | |
| 6-13 | N/C | |

Table D- 6. Power Supply Connector J1

| Connector J1 Pin | Color | To |
|---|---|---|
| 1 GND | | |
| 2 N/C | | |
| 3 | Black | On/Off Switch |
| 4 N/C | | |
| 5 | White | AC Inlet |

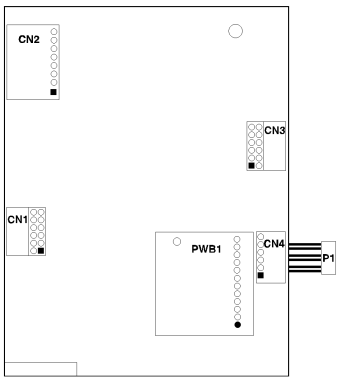



**Figure D- 1. Stacker Control Board.**

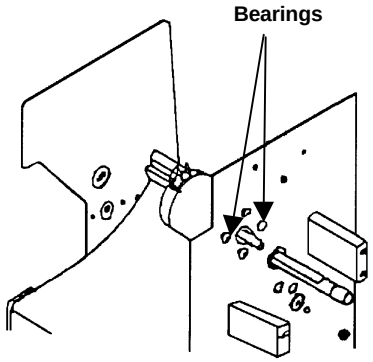



**Figure D- 2. Stacker Lubrication Points.**

# LUBRICATION

The stacker should be lubricated whenever the idler shafts are replaced.

**NOTE:** Do not get lubricant on stacker rollers or belts; performance could be adversely affected.

1. Turn stacker and printer off.
2. Remove stacker from knife assembly.
3. Remove the stacker rear and side covers.
4. Apply silicon lubricant to the two bearing on the rear frame and two bearings on the front frame. See Figure D-2.
5. Replace the stacker covers.
6. Reattach stacker to knife.
7. Turn on printer and stacker and test for correct operation.

# MAINTENANCE PROCEDURES

Use the illustrations provided and the Stacker Illustrated Parts Breakdown for assistance in performing maintenance. Maintenance procedures for the stacker are described below.

Note the following general safety reminders before servicing the stacker. Additional Warnings and Cautions are provided where appropriate as they apply to specific procedures.

## WARNING

Never perform maintenance on the stacker with the power cord connected. Doing so exposes points where AC voltages are present. Reattach power cord only when test procedures indicate that power is required.

## CAUTION

Static electricity can damage stacker parts. Use a static ground wrist strap.

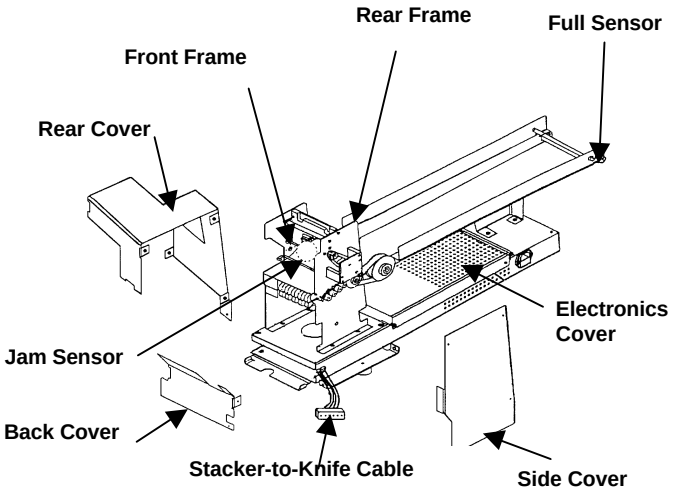



**Figure D- 3. Model 928 Stacker Assembly.**

# REPLACE ROLLERS

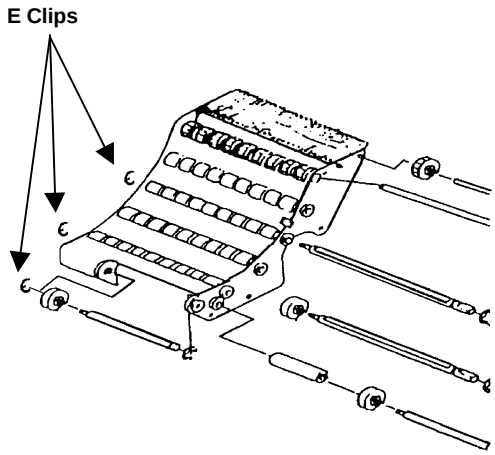



**Figure D- 4. Lower Transport Rollers.**

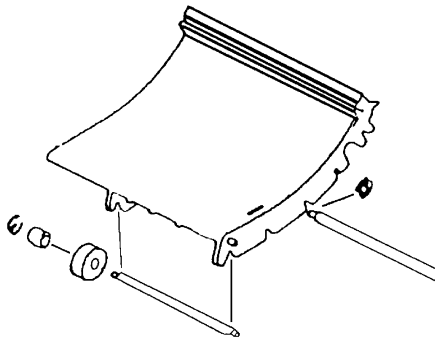


**Figure D- 5. Upper Transport Rollers.**

1. Unplug stacker power and stacker-to-knife cable.
2. Remove side, rear, and back covers as necessary to access rollers being replaced.
3. From front main frame side, remove E-ring holding the shaft containing the rollers being replaced.
4. Withdraw the shaft from the rear frame side.
5. Remove rollers from the shaft while withdrawing the shaft from the frame.
6. Reassemble in reverse order.

If replacing serrated rollers, make sure teeth face up (toward end of stacker bed).

## *Replacing Transport* A*ssembly*

1. Disconnect the power.
2. Remove the upper transport lockshaft or (BAIL) and set aside.
3. Remove transport covers (118480 / 118479 / 118532).
4. Remove aluminum support plate (110590) to acess the lower drive shaft pulley and spur gear.
5. Loosen the set screws from the lower drive shaft pulley (110594) and spur gear (098330).
6. Remove aluminum pulley (098367) to allow lower exit drive shaft's spur gear clearance for removal.
7. Remove the pulley and spur gear.
8. Remove the lower drive shaft pulley (110594) and white spur gear (098330).
9. Remove the remaining four white spur gears (098330).
10. Remove the four black idler gears (098373) and keep the attaching screws and nylon washers.
11. Remove the E-Ring from the gear train side of the rear main frame (118475) on the upper exit drive shaft (098320).
12. Pull out the old drive shaft from the front main frame (118476, operator side of 928).
13. Turn the 928 upside down and remove the front mounting plate (118467) to allow access to the front main frame (118476) mounting screws.
14. Remove the two front main frame screws.
15. Turn the stacker upright and remove all of the E-rings and screws holding the front main frame (118476) attaching assemblies.
16. Disconnect the spring from the tamper plate to allow the front main frame (118476) to be

removed from the stacker. Be careful not to lose the spring.

17. Slide the front main frame off the tamper plate shaft and gently pull it clear of the stacker.
18. The old lower transport assembly should now be held in place by the four remaining plastite screws on the rear main frame (118475).
19. Remove 4 screws holding the assembly in place, and remove the lower transport assembly.
20. Install the replacement kit.
21. Reassemble in reverse order.

## Replace DC Motor

1. Unplug stacker power and stacker-to-knife cable.
2. Remove rear, back, and side covers.
3. Disconnect motor wiring harness at motor terminals 1 and 2.
4. Remove four motor mounting screws, belt, and motor assembly.
5. Reassemble in reverse order.

## Replace Stepper Motor

1. Unplug stacker power and stacker-to-knife cable.
2. Remove rear, back, and side covers.
3. Loosen set screws and remove belt speed adjustment knob.
4. Remove belt adjustment potentiometer mounting nut and washer.
5. Remove four screws and electronics cover.
6. Disconnect motor wiring harness at control board connector P1.
7. Remove four motor mounting screws, belt, and motor assembly.
8. Reassemble in reverse order.

## Replace Stacker Sensors

The stacker full and stacker jam sensors share the same wiring harness, so replace as an assembly.

1. Unplug stacker power and stacker-to-knife cable.
2. Remove screw attaching stacker full sensor to stacker bed.
3. Remove 2 clips holding sensor wiring harness to the stacker bed.
4. Thread sensor cable through frame to control board.
5. Loosen set screws and remove belt speed adjustment knob.
6. Remove 4 retaining screws and electronics cover.
7. Remove 4 screws holding control board to standoffs.
8. Slide sensor out of transport mounting and thread sensor cable through frame back to control board.
9. Move control board back to expose sensor wiring harness connector.
10. Disconnect wire harness from control board connector CN3 and remove sensor.
11. Reassemble in reverse order.

## Replace Power Supply

1. Unplug stacker power and stacker-to-knife cable.
2. Loosen set screws and remove belt speed adjustment knob.
3. Remove belt adjustment potentiometer mounting nut and washer.
4. Remove 4 retaining screws and electronics cover.
5. Remove four power supply mounting screws.
6. Tilt power supply up to disconnect wiring harness at connectors J1 and J2.
7. Remove power supply.
8. Reassemble in reverse order.

## Replace Control Board

1. Unplug stacker power and stacker-to-knife cable.
2. Loosen set screws and remove belt speed adjustment knob.
3. Remove belt adjustment potentiometer mounting nut and washer.
4. Remove 4 retaining screws and electronics cover.
5. Disconnect harness connectors at control board connectors J1, J2, and J3.
6. Remove the four screws holding the control board to the standoffs.
7. Disconnect power supply harness at control board connector CN1.
8. Remove control board.
9. Reassemble in reverse order.

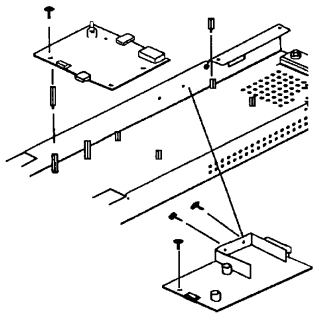


**Figure D- 6. Power Supply/Control Board.**

# APPENDIX E 926 KNIFE ASSEMBLY

The 926 Knife only works with a 9835 printer.

## KNIFE SPECIFICATIONS

| | |
|---|---|
| Height: | 8.5 inches (216mm) |
| Width: | 9.3 inches (236mm) |
| Depth: | 7.6 inches (193mm) |
| Weight: | 9.0 pounds (4.1 Kg) |
| Shipping Wgt: | 9.5 pounds (4.3 Kg) |
| Power: | Input Voltage; 24.0 Vdc. (From 9835 Printer). |
| Output Voltage: | 12.0 Vdc and +5Vdc to Stacker Assembly |
| Operating Limits: | 40 to 104 degrees F |
| | (4 to 40 degrees C) |
| Storage Limits: | 15 to 120 degrees F (-10 to 49 degrees C) |
| Relative Humidity: | 5 to 90 percent non condensing |
| Speed: | Up to 6.0 inches (152mm) per second |

## TAG CUT DIMENSIONS

| | |
|---|---|
| Width: | 1.2 to 4.0 inches (30 mm to 102 mm) |
| Lengths: | 1.2 to 16 inches (31 mm to 406 mm) |
| Thickness: | 0.007 inch to 0.010 inch (0.18 mm to 0.25 mm) |

**NOTE:** Supply roll must be wound printed side in. Labels should not be cut.

## FUNCTIONAL DESCRIPTION

The 926 Knife Assembly consists of the following modules:

- Blade Assembly
- Drive Board
- DC Drive Motor
- Solenoid

The Knife Assembly is attached to the front of the 9835 Printer beneath the print module. It is fastened to the printer base with three fasteners and has two wiring harnesses that connect to the 9835 Feature Board at connectors CN4 and CN5. A separate harness carries power to the knife from printer control board connector CN11. The knife drive board also has a connector to attach cabling to the 928 Stacker Assembly.

### *Functional Description*

The Knife Assembly is controlled by the Feature Board installed in the 9835 Printer. All power to the knife is provided by the printer via cabling from the printer control board. The rotary knife has a helical blade positioned below the supply path and is activated by the knife solenoid.

The knife is driven by a DC motor controlled via software by the printer. When the knife is enabled (by software) the motor is turned on and a solenoid, located on the Blade Assembly, is energized, and the knife blade completes one rotation, producing a cut tag. (The motor runs constantly as long as there is power to the knife.)

The Knife Assembly also has circuitry to provide 12 Vdc power and necessary control signals to the attached 928 Stacker Assembly. The functionality of the stacker is explained in Appendix D.

## TROUBLESHOOTING

Drive Board circuits generate two error codes to assist in the detection of knife failures. Error 759 indicates that the knife is not moving and Error 760 indicates a knife jam.

The following paragraphs contain suggestions for troubleshooting the two conditions. Voltage tests are also included to further isolate a knife failure.

### *Evaluation of Error 760*

The printer software reports an Error 760 when a knife jam is detected. The following checks are suggested to correct the problem:

1. Turn printer off.
2. Check supply path for jammed tags, or obstruction in path.

3. Check Blade Assembly alignment and ensure assembly mounting screws are tight.
4. Verify supply type; cutter only cuts tags. Labels should not be cut.
5. Check to ensure tags being used do not exceed 0.010 inch (0.25 mm) thickness.

## *VOLTAGE TESTS*

Before replacing the Drive Board, check for the static voltages shown in Table E-1 to determine if the board has failed. If all voltages are correct, troubleshoot the 9835 printer control board. See Chapter 3.

1. If 25Vdc is not detected at J3 pin 1, the printer is not providing power to the knife drive board. Troubleshoot the printer.
2. If 25Vdc is detected at J3, pin 1, but not at both pins of J1 and J2, replace Knife Drive Board.
3. If 25Vdc is detected at J1 but not at J2, replace solenoid.
4. If 25Vdc is at J2 but not J1, replace knife drive motor.

Table E- 1. Knife Drive Board Voltages.

| Connector | Voltage |
|---|---|
| J1 | 25v on both pins |
| J2 | 25v on both pins |
| J3 | 25v on pin 1 only |
| J5 | |

| Connector Pin | Voltage |
|---|---|
| 1 | ——— |
| 2 | 5v |
| 3 | 5v |
| 4 | ——— |
| 5 | ——— |
| 6 | 5v |
| 7 | 5v |
| 8 | 5v |
| 9 | ——— |

# LUBRICATION

To prevent excessive wear, the knife should be lubricated every 100,000 cuts. (Approximately, every 10 rolls of 1.2" supply.) A Knife Lubrication Kit (Part Number 118782) is available.

**NOTE:** Lubricate with multi-purpose grease using a long cotton swab. Do not over lubricate. Do not get grease on knife blade or performance could be affected.

1. Turn printer off.

**NOTE:** The knife unit has two cam surfaces that should lubricated with multi-purpose grease.

2. Using a long cotton swab, lubricate the knife cams.
3. Turn printer on and test for correct operation.

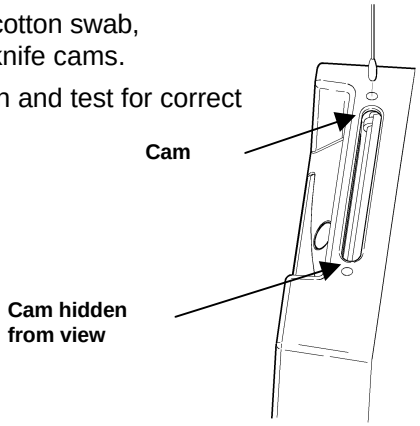



**Figure E-1. Knife Lubrication Points.**

# MAINTENANCE OVERVIEW

This section describes removal and replacement procedures for the knife assembly. See Figure E-2 for printer-to-knife connector locations. See Figure E-3 to identify parts and assist in performance of maintenance procedures. Figure E-4 shows the location of connectors on the drive board.

# GENERAL SAFETY TIPS

Observe these general safety precautions before servicing the knife. Additional Warnings and Cautions appear in this document as they apply to specific procedures.

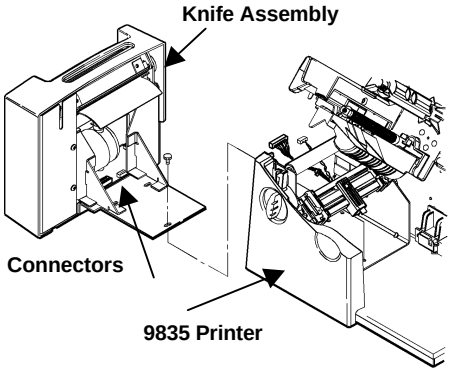



**Figure E-2. Location of Connectors.**

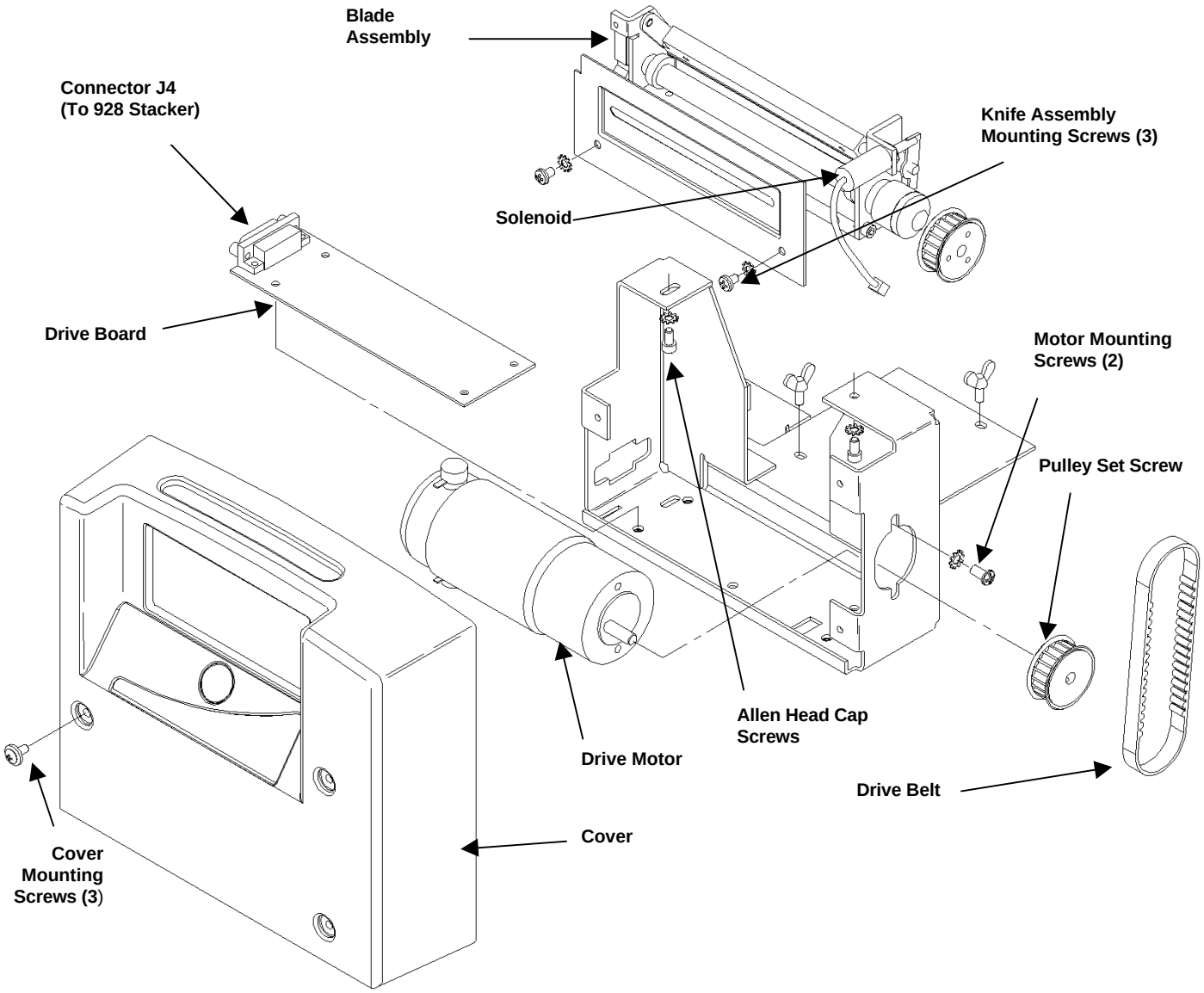
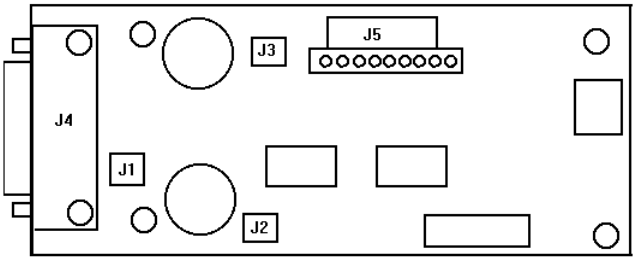



**Figure E-3. Knife Assembly.**




| | | | |
|---|---|---|---|
| **J1** | To Motor | **J4** | To 928 Stacker |
| **J2** | To Solenoid | **J5** | To Printer Daughter Board |
| **J3** | To Printer Control Board | | |

**Figure E-4. Drive Board Connector Locations.**

## *Blade Assembly Replacement*

1. Turn printer off.
2. Remove 928 Stacker Assembly. See Appendix D.
3. Remove three cover screws to gain access to the Blade Assembly.
4. Note the position of the Blade Assembly in relation to its mounting frame. This relationship is critical to provide a straight cut from left edge to right edge of tag.
5. Using an Allen wrench, remove two cap screws that attach the knife unit to its mounting frame.
6. Disconnect solenoid at connector J2 on Drive Board.
7. Remove the Knife Blade Assembly.
8. Reassemble in reverse order.

**NOTE:** Carefully align the edge of the knife assembly to the mounting frame. There should be almost no variation side to side on a cut tag (0.030 +/- 0.020). The mounting hole closest to the operator panel is slotted for this adjustment.

9. Adjust Blade Assembly. When a straight cut across the tag has been achieved, lock down all adjustments.
10. Run 50 - 100 tags to verify proper cut operation.
11. Replace the knife cover.
12. Attach the Stacker Assembly, see Appendix D.
13. Turn printer on and test for correct operation.

## *Drive Board Replacement*

Replace the Drive Board using the following procedure:

1. Turn printer off.
2. Remove the Stacker Assembly, see Appendix D.
3. Remove three cover screws to gain access to the Drive Board.
4. Note the positions of all wiring harness connections.
5. Disconnect each harness from the Drive Board.
6. Lift the Drive Board off its standoffs.
7. Reassemble in reverse order.
8. Attach the 928 Stacker Assembly and test for correct operation.

## *Motor Replacement*

1. Turn printer off.
2. Remove 928 Stacker Assembly. See Appendix D.
3. Remove three cover screws to gain access to the motor.
4. Remove two motor mounting screws and remove motor.
5. Remove knife motor wiring at motor connector.
6. Loosen the pulley set screw and remove pulley. Make sure set screw is on flat of shaft.
7. Reassemble in reverse order.

8. Adjust belt tension.
9. Squeeze halfway between pulleys. When distance from outside of one side of belt to outside of opposite side is approximately 1.0”, tighten screws on motor.
10. Turn printer on and test for correct operation.
11. Replace the knife cover.
12. Attach the Stacker Assembly to the Knife Assembly, see Appendix D.

# CONNECTORS AND CABLES

The following tables provide pinouts for the Knife Assembly cables and connectors.

Table E- 2. Drive Board Connector J1.

| To Motor Terminal | Signal | Pin |
|---|---|---|
| 1 | 25 Vdc | 2 |
| 2 | 25 Vdc | 2 |

Table E- 3. Drive Board Connector J2.

| To Motor Solenoid Terminal | Signal | Pin |
|---|---|---|
| 1 | 25 Vdc | 1 |
| 2 | GND | 2 |

Table E- 4. Knife Drive Board Connector J3.

| From Printer CN11 Pin | Signal | Pin |
|---|---|---|
| 1 | 12Vdc | 1 |
| | 12Vdc | 2 |

Table E- 5. Drive Board Connector J4 To 928 Stacker Assembly.

| Pin | Signal | Pin |
|---|---|---|
| 1 | STKR_PRESENT | 1 |
| 2 | STKR_ERROR | 2 |
| 3 | STKR_ENABLE | 3 |
| 4 | +12Vdc | 4 |
| 5 | GND | 5 |
| 6 | GND | 6 |
| | N/A | 7 |
| | N/A | 8 |
| | N/A | 9 |
| | N/A | 10 |
| | N/A | 11 |
| | N/A | 12 |
| | N/A | 13 |
| | N/A | 14 |
| | N/A | 15 |

Table E- 6. Knife Drive Board Connector J5.

| From Printer Daughter Board | Signal | Pin |
|---|---|---|
| CN5 PIN 5 | GROUND | 1 |
| CN5 PIN 1 | STKR_PRESENT | 2 |
| CN5 PIN 2 | STKR_ERROR | 3 |
| CN5 PIN 3 | STKR_ENABLE | 4 |
| CN4 PIN 6 | GROUND | 5 |
| CN4 PIN 1 | CUT_PRESENT | 6 |
| CN4 PIN 3 | CUT_ENABLE | 7 |
| CN4 Pin 2 | CUT_ERROR | 8 |
| CN5 PIN 5 | CUT_CONTROL | 9 |